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THE UNIVERSITY OF ALBERTA

SETTLEMENT PROCESS AND LAND USE CHANGE -

LETHBRIDGE-MEDICINE HAT AREA

by



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A THESIS

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The undersigned certify that they have read and recommend to the Faculty of Graduate Studies for acceptance, a Thesis entitled "Settlement Process and Land Use Change - Lethbridge-Medicine Hat Area," submitted by Robin Barrie Mallett in partial fulfilment of the requirements for the degree of Master of Arts.

ABSTRACT

The Lethbridge-Medicine Hat area, closely following the south bank of the Oldman - South Saskatchewan Rivers, is in the heart of Alberta's semi-arid short grassland country. It has witnessed great changes in the natural environment over the past 100 years, resulting from a number of activities which were carried on there. These included ranching, coal mining, homesteading, dry-land farming, and finally, irrigation farming. The nature of the landscape, which can be both monotonous and starkly beautiful at the same time, when combined with the causes and effects of the various activities previously mentioned, stimulated an interest which has led to the investigation and discussion of the development of this area into the prosperous and intensely cropped irrigation farming area which it is today.

The initial settlement of the area, beginning in about 1885, was both rapid, and unique, in that it was carried out with little concern for the physical environment. Among the settlers who entered the area, were found a great variety of nationalities, with a large range of farming experience. Whether the initial homesteaders were successful or not in their farming ventures, each one, in his

success or failure , has contributed to the knowledge and experience that was to be used later to modify farming methods so that better advantage of the natural environment could be made.

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CHAPTER I

INTRODUCTION

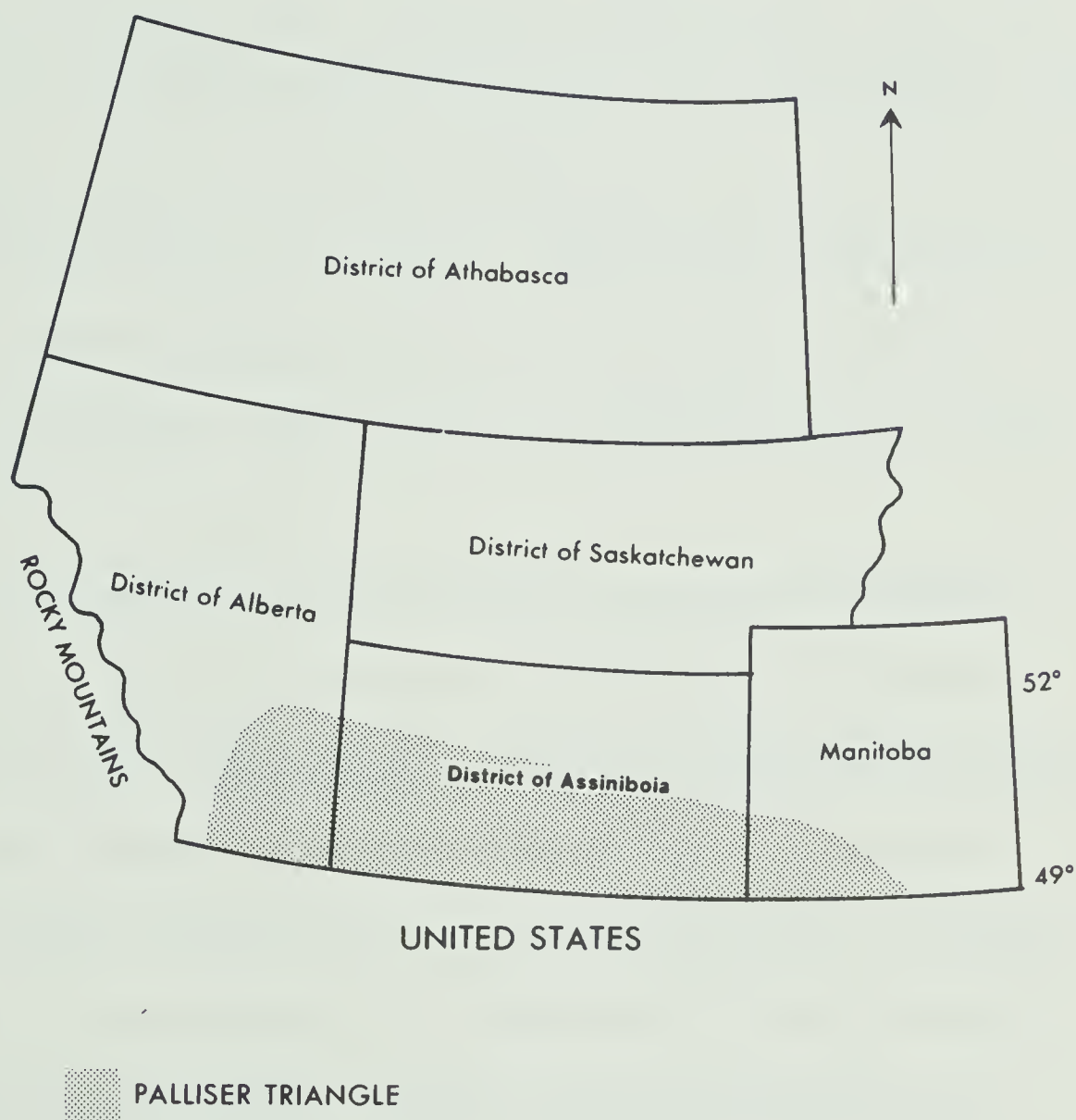
HISTORICAL BACKGROUND

In 1857, Captain John Palliser was commissioned by the government of Great Britain to make a survey of Western Canada, lying between the North Saskatchewan River and the Canadian-American border; and between the Red River of Manitoba and the Rocky Mountains to determine its suitability for agriculture. The total area of his survey consisted of fifty million acres in Canada, was roughly triangular in shape (with a base line of 49° north latitude and the apex at 52° north latitude), and it became known as the 'Palliser Triangle.'¹ Making use of rather limited observations, and gross generalizations, Captain Palliser wrote up his report for the British government. He stated that the area was one of short grass and light brown soil, rather low in organic matter.² Considering these factors and the usual yearly deficiency of rainfall, Captain Palliser reported that the entire area

¹Gershaw, "The Short Grass Area," A History of Southern Alberta, 1956, p. 100.

²Loc. cit.

WESTERN POLITICAL DISTRICTS and the PALLISER TRIANGLE, 1898



Source: Atlas of Alberta, p. 46,
and Gershaw, The Short Grass Area

MAP 1.1

was unsuited to agriculture. Observations such as Palliser's were widely accepted in the pre-railway era of western Canada, and only served to hinder the advancement of civilization and settlement on the Canadian prairies.

Contrary to Palliser's report, however, southern Saskatchewan and Alberta, and southwestern Manitoba has become one of the major agricultural areas of Canada; and southern Alberta, with its irrigation projects, has grown into Alberta's most successful and highly intensified agricultural area. "The land that Captain Palliser explored for the British government just one hundred years ago, produced much food. It has become the dwelling place of contented people."³

Very little activity in the form of permanent settlement occurred in southern Alberta until the development of organized ranching in 1880. This brought vast herds of cattle from the United States, and cattlemen from as far south as Texas, to the prairie region of Alberta south of the South Saskatchewan River. The first big ranch to be established was the Medicine Hat Ranch, located a few miles south of Redcliff, Alberta, and operated by Messrs. Tweed, Finlay, Ewart, and Pearson.⁴ The federal government set

³F. W. Gershaw, op. cit., p. 123.

⁴J. W. Morrow, Early History of Medicine Hat Country, 1923, p. 46.

up a system of land rental in 1880 where ranchers could rent up to 100,000 acres at one dollar per acre, and large scale ranching on the prairie region of southern and southeastern Alberta flourished until the early 1880's when squatters appeared on the scene and the age-old battle started between open-range ranchers and the homesteaders.

Settlement in southern Alberta remained isolated from trade and commerce in eastern Canada, and along the Pacific Coast of British Columbia and the United States - the result being a very slow population growth rate, until the coming of the railway in 1885. Previously, settlements were confined to narrow margins of land along rivers and streams, where access to water made transportation quicker and easier than horseback, wagon, or on foot, but the railway brought a federal government policy to the west, a 'grid' pattern of land survey similar to that of the midwestern United States. Even numbered sections of grazing land were soon thrown open for homesteaders, pre-emptions or for sale. The building of the railway, then, was a very significant factor in the development and progress of settlement and agriculture on the prairies, for with more reliable means of transportation and communication, the population could settle away from the rivers and streams.

The population of southern Alberta grew steadily following construction of the Canadian Pacific Railway main line from Medicine Hat to Calgary, and the Crow's Nest line from Dunmore to Lethbridge, with a resulting increase in both agricultural produce and acreage under cultivation. The Canadian west witnessed expansion of land settlement during the first fifteen years of the twentieth century that was unsurpassed even by the opening of the American west.⁵

The war years of 1915 and 1916 saw very good crops grown throughout the prairie region, "but after that, for many years, the searing winds and the lack of rainfall caused almost complete crop failures."⁶ The ranchers, as well, in this southern region, suffered a great deal, as it took from 30 to 40 acres to feed one animal, and often water supply was almost nonexistent.⁷ The dry years continued almost constantly from 1919 to 1930, when the stock market collapsed and general depression ensued. The economic and social conditions of the depression years also affected agriculture tremendously because, with the lack of operating capital, and inadequate returns from the sale of their produce,

⁵J. C. Bonar, The Canadian Pacific Railway Co. and Its Contributions Towards the Early Development and to the Continued Progress of Canada, vol. 5, p. 5.

⁶Gershaw, The Short Grass Area, 1956, p. 100.

⁷Ibid, p. 101.

enthusiasm among farmers dwindled, and little could be done to prepare and maintain the land. The rapidly deteriorating economic conditions, combined with the unprecedented dry years and inappropriate cultivation practices, resulted in the 'Dust Bowl' of southern Alberta and Saskatchewan. A recovery was made in the latter part of the 1930's with improved agricultural methods and increased irrigation acreage. Since World War II, agricultural advancements in the irrigation area of southern Alberta have made it a most productive and diversified region.

AIMS OF THE RESEARCH

The region of southern Alberta lying immediately south of the Oldman and the South Saskatchewan Rivers, and presently influenced by large irrigation schemes, is part of that area described in Palliser's report, and is probably the most outstanding example of intensified agricultural development in the Canadian prairies. It is the purpose of this paper to trace the settlement process and the sequential development of agriculture, thus showing the effects of various phenomena on the use of agricultural land. Of importance are the changes in preception of agriculture, first by the ranchers, then the homesteaders, and finally, by farmers practicing irrigation. As man's knowledge of the capabilities and limitations of this environment became more accurate, so also did his use of the land

change. Because the Canadian Pacific Railway branch line from Dunmore to Lethbridge was one of the first of a series of major influences on land use, the date 1880, which was five years before construction of the C.P.R. main line across the prairies, was selected to begin the period of time with which this study is concerned. This date is also five years before the construction of the Crow's Nest Line from Medicine Hat to Lethbridge. Thus is it possible to draw definite conclusions as to how the railway affected land use, by looking at the land before and after construction of the railway. From that time on, until the outbreak of World War II, in 1939, agriculture in the area immediately adjacent to the Crow's Nest Line between Lethbridge and Medicine Hat was both developmental and experimental. It is the changes in land use during this period of approximately sixty years, (1880 - 1940), that concerns the researcher; the changes being responses to cultural, psychological, economic, and physical-climatic conditions. Although several factors have led to recent land use changes in the area, it was felt that 1939 - 1940 is a significant 'cut-off' date because it represents the beginning of the trend towards world competition for grain markets, large scale mechanized farming, and an era where farmers were starting to invest large amounts of capital into improving and consolidating their landholdings.

In order to understand and appraise the differing viewpoints of government officials, ranchers and farmers, a wide cross-section of literature was examined. This included many government, agricultural and historical publications, as well as publications by such authorities on the area as J. D. Higginbotham, J. H. Gray, F. W. Gershaw, A. E. Miller and A. Johnston (presently of the Lethbridge Experimental Station). Field trips through the district provided valuable insights into the physical and cultural conditions, and also gave the opportunity for obtaining photographic evidence and personal interviews with several knowledgeable individuals having a lifetime of experience in the field area.

To supplement the historical-developmental literature, access to air photos was important, as well as files and maps of land use and irrigation projects from the Provincial Archives, various publications from the Glenbow Alberta Institute in Calgary, sequential maps of purchasable agricultural land, clippings from Lethbridge and Medicine Hat newspapers, and land records from the Department of Lands and Forests. The Homestead Files, or land records from the Department of Lands and Forests were used as the prime source of data, as they revealed information concerning the fulfillment of a homesteader's obligations after receiving his homestead quarter section. The regulations he had to comply with

concerned his residence on the land, and his success in breaking and cropping the land. The Homestead Files also included such information as dates of homestead entry and patent,* location of the quarter section, improvements (such as buildings) and finances available for improvements, place of birth of the homesteader, and his place of origin (where he emigrated from). One problem in establishing correlations, however, was that the types of information previously mentioned were not always included on every homestead file.

DEFINITION OF THE STUDY AREA

The selection of the Medicine Hat-Lethbridge region of southern Alberta was the result of four factors:

1. This area in historical terms, was easily accessible for ranchers and farmers of the western United States.
2. The environmental characteristics, as well as various socio-economic and cultural factors have made this area, through a period of time, Alberta's most diversified and highly intensified agricultural region.

*Note: The patenting of a quarter section or homestead was the transferring of legal ownership of that land to the individual who was occupying it, when he had successfully fulfilled homestead obligations.

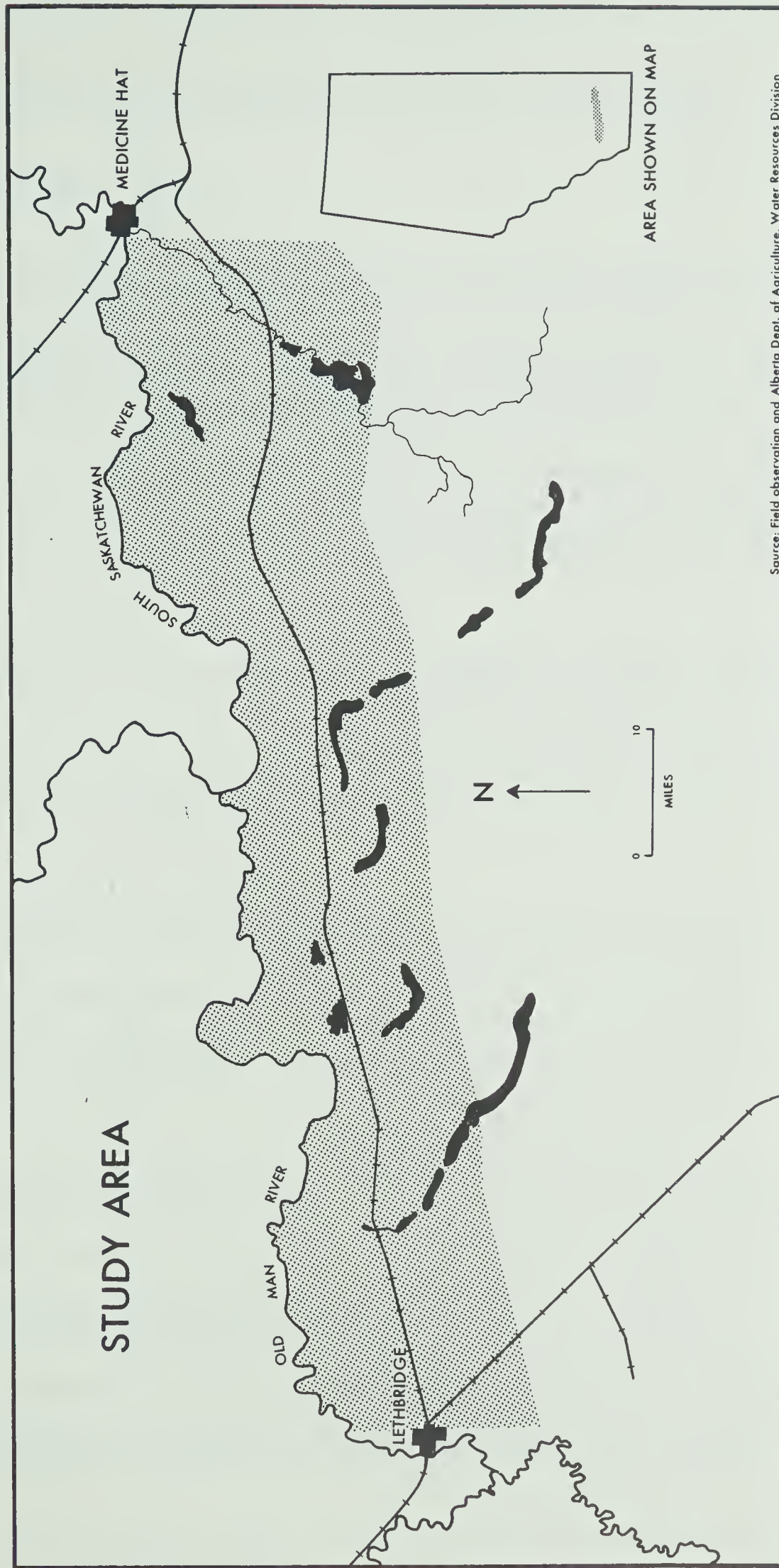
3. Construction of the rail line in the area and the subsequent in-migration of homesteaders provides a substantial platform upon which to base an analysis of man-land changes.
4. In addition, the presence of an earlier phase of pastoral occupation provided a useful comparison with later agricultural activities.

The limitations as to the size and shape of the study area were arrived at after considering the following factors:

1. The Oldman and South Saskatchewan Rivers were a rather formidable barrier to communication and travel in a north-south direction, and therefore, form a natural northern boundary to the study area.⁸
2. By the study of various historical publications, and by interviewing various authorities on the area, it was found that the average maximum distance to be covered by oxcart or wagon in one direction and on one day, was approximately eight miles. Therefore, assuming the importance of the 'tank' towns along the Lethbridge-Medicine Hat rail line as supply and trading centers for the immediate agricultural areas, the southern boundary of the study area was set at eight miles from the railway.
3. Lethbridge and Medicine Hat are located on the western and eastern limits of the area respectively, because of their initial importance as the major terminals of the Crow's Nest rail line (prairie section).

The study lies wholly or in part, within 51 townships. These townships lie between 110° 41' west longitude and 112° 46' west longitude,

⁸Pers. comm. E. Miller, Lethbridge, 1970.



Source: Field observation and Alberta Dept. of Agriculture, Water Resources Division

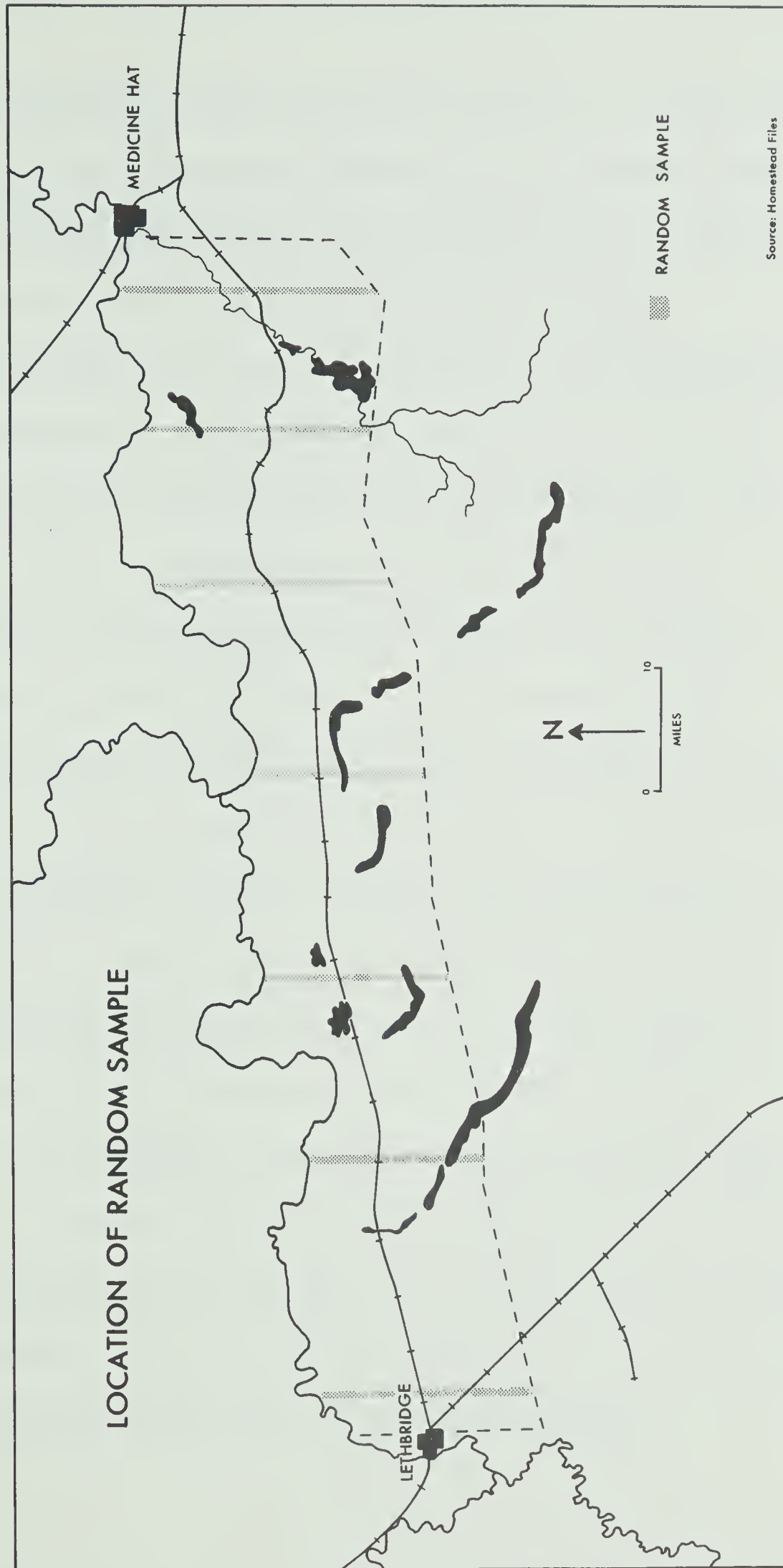
and between $49^{\circ} 35'$ north latitude and $50^{\circ} 04'$ north latitude.

METHODOLOGY

The quarter section was chosen as the basic unit to be investigated in determining the influence of various phenomena on the use of the land. The quarter section, as determined by the Canada Homestead Act of 1871, consists of one hundred and sixty acres. This came to be the basic unit for homesteading, and thus represents a suitable basis for study.

Because of the extremely large number of quarter sections in the study area, (5,585), it was virtually impossible to investigate the information available for every quarter section. For this reason, a random sample was selected.

Having in mind the large number of quarter sections (5,585), and the finite limitations of both time and resources, a four per cent sample was ultimately chosen, consisting of 225 quarter sections. In order to eliminate the chance of clustering of the sample areas, (and the possible over-representation of any portion of the study area), the entire area was stratified, or divided into seven subdivisions along the length of the railway. (Map 1.3 showing location of randomly selected quarter sections). From within each subdivision, quarter sections were randomly chosen for



MAP 1.3

detailed examination, together with those abutting one another north as far as the Oldman-South Saskatchewan Rivers, and to the south as far as the eight mile boundary limit. (Refer back to Map 1.2). The result was the selection of the 225 quarter sections.

A chi-square test was performed on a common parameter that was available for every quarter section, to test whether this random sample was representative of the entire population. The parameter that was used was 'soil capability for agriculture ratings.' (Provincial Department of Pedology). These ratings were qualitative expressions based on a seven point system of evaluating the soil capability for agriculture. Soil Class I has no significant limitations to agricultural endeavors. Soil Class II has moderate limitations requiring moderate conservation practices, and Class III has moderate to severe limitations to range crops. Severe limitations restricting the range of crops and requiring conservation practices characterize Soil Class IV. Soil Class V severely limits capability of the soil to produce perennial forage crops; improvement tactics are feasible. Soil Class VI is capable only of producing perennial forage crops, and improvement tactics are not feasible. The poorest quality soil, Class VII, is not capable of supporting any arable culture or permanent pasture.

TABLE I

PERCENTAGE FREQUENCIES OF SOIL CAPABILITY
FOR AGRICULTURE RATINGS FOR THE
SAMPLE AREA AND THE STUDY AREA

Soil Rating	% Frequency of Sample	% Frequency of Entire Area
1	23.15%	18.62%
2	14.95%	17.88%
3	15.28%	14.60%
4	23.81%	29.66%
5	11.85%	9.03%
6	10.52%	9.79%
7	<u>.44%</u>	<u>.42%</u>
	100.00%	100.00%

A statistical test, (the chi-square test), was used to measure the level of confidence that could be placed in the sample, thus providing some indication of the sample's reliability in representing the entire study area. In performing the chi-square test to determine the "representativeness" of the sample, it was decided that the percentage frequencies of the random sample and of the entire area should be considered the 'observed' frequencies, and the 'expected' frequencies respectively.

The degree of departure between the sample observations (O_i) and the observations of the entire area (e_i) can then be

determined. The Yates Correction for continuity

$$\chi^2 = \frac{\sum E_i (O_i - e_i - .5)^2}{e_i}, \quad 9$$

was used, in preference to the basic chi-square formula of

$$\chi^2 = \frac{\sum E_i (O_i - e_i)^2}{e_i}, \quad 10.$$

The limited number of degrees of freedom (N-1), where N is the number of soil capability classifications, necessitated the use of the Yates correction. This correction consists of subtracting 0.5 from the discrepancy between the 'observed' and the 'expected' in every cell in which the expected value is less than 5. The chi-square value will be low, as will the corresponding probability level, if the distribution of the percentage frequencies is representative of the percentage frequencies of the entire sample. The chi-square values are presented in table form, in a manner that shows the degree of 'chance' that existed in the sample frequency distribution.¹¹ From the data found in TABLE I, a chi-square value of 1.526 was calculated. With six degrees of freedom, the chi-

⁹R. S. Weiss, Statistics in Social Research, pp. 264-265.

¹⁰S. Gregory, Statistical Methods and the Geographer, pp. 151-158.

¹¹Arkin and Colton, Tables for Statisticians, p. 126.

square value was significant at the .05 probability level. We might say, then, that five times out of one hundred, the element of chance has determined the variation between the 'observed' and the 'expected' frequencies. Therefore, an association with 95 per-cent probability exists between the two sets of data when analyzed on the basis of one parameter - the 'soil capability for agriculture' ratings. The probability level of .05 can be considered significant, and the sample is therefore "representative," when based on the limited number of soil capability ratings (7), and the resulting number of degrees of freedom.

Despite the comparatively sophisticated techniques available for ensuing objectivity and representativeness of a sample, historical geographers are often thwarted in their attempts to carry out more precise procedures by a frustrating lack of complete records.

In this research, even though the Homestead Files proved to be a valuable source of data, because of certain gaps, they were not always amenable to statistical treatment. Data found in the Homestead Files was not complete for all cases; however, it generally revealed sufficient information dealing with the birth-place and place of origin of the homesteader, his previous occupation and size of family, the value of improvements on his

property, presence of wells, location and distance of homestead from the railway, the number of acres broken and cropped during each year from entry date to patent date, and the actual dates of entry and patent. The reasons for abandonment or cancellation of the homestead entry were occasionally given as well.

Although each quarter section in the random sample (225 quarter sections) was investigated, there was found to be very substantial areas of block ownership by both the Hudson Bay Co. and railway companies. Despite considerable investigations, no information is available from the Edmonton Lands Office or Ottawa, concerning the homestead data on these lands. As a result, the total number of quarter sections providing information about the process of settlement was limited to 85. Although this number of cases was considerably less than the total random sample population, it was felt that the validity of the study was not greatly reduced, because of the nature of the random selection of samples, and the comparatively generous initial sampling fraction of four percent.

The data that was found on the Homestead Files was coded so that it could be processed by computer. The nature of the data, being mainly qualitative, ruled out the use of rank-order correlations, and cross tabulations were used to supply significant

results. Those variables which were quantitative such as the number of acres broken and cropped, for each quarter section, and the value of improvements on each homestead quarter section could not be correlated with any of the qualitative statistics.

Although a significantly larger number of calculations were undertaken than appear in the text, other results were discarded because the data found in different variables was incomplete and, therefore, greatly reduced the significance of those variables. Absolute and simple percentage frequencies were used for most cross tabulations because it was felt that the use of these would simplify and clarify the distribution among the sample quarter sections of the variables being used. Again, the qualitative nature of the statistics influenced the use of simple percentage and absolute frequencies.

CHAPTER II

THE PHYSICAL SETTING

I. INTRODUCTION

An understanding of the physical environment of an area is essential in considering the settlement process and pattern, and land use changes. The physiographic features must be weighed to help determine the nature and dimensions of their influence; why man reacted the way he did to the environment, and how he endeavored to overcome adverse environmental conditions. Thus, in an historical settlement land use study, it is important to consider the environmental features as the rancher, homesteader or government agent might have perceived them, to the extent that the data allow, rather than analyzing the physiographic features in terms of modern scientific measurements that were at that time unknown. When discussing the physical background, the distinction should be drawn between the information available at the time of survey, or land selection, (or that which was easily observable from field trips to the area), and that which has become available subsequently, through more precise methods of measuring and recording.

II. THE ENVIRONMENT - AS THE HOMESTEADER COULD PERCEIVE IT.

CLIMATIC CHARACTERISTICS

Palliser's report to the British government in 1857 strengthened the belief that southern Alberta was an arid land, altogether useless for agriculture. As late as 1871, Butler in "Great Lone Land," described this part of the province as "arid, treeless and impossible of settlement."¹ Little else was known about southern Alberta, and particularly the Lethbridge-Medicine Hat area, other than quotes such as Butler's, and the word of Indians, trappers, and the Northwest Mounted Police Officers. It was with the thought of the hot, parched plains in mind that caused numerous ranchers in the 1870's and 1880's, who had migrated from the United States, to move their cattle herds through the study area, to the cooler, more richly pastured lands of the foothills. This was not to say that ranching was doomed to failure on the semi-arid plains of the study area, because the conflict between ranchers and squatters was much in evidence at the coming of the railway in 1885. Dr. A. E. Palmer as well, stated that many of the early grazing lands in

¹D. Diller, (Unpublished M. A. Thesis), The Early Economic Development of Alberta Previous to 1905, 1923, p. 55.

the study area were practically decimated due to the lack of knowledge by the ranchers of the carrying capacity of the grazing lands, and the consequent overgrazing.² Obviously, they had failed to appraise the acute lack of moisture that was characteristic of the area.

With very little experience on which to base their knowledge of climatic conditions in the study area, the homesteaders were forced initially into trial and error cropping methods, and many were driven to abandon their farms. Not only had they very little knowledge of the hot searing summer winds, and lack of winter snowfall, but they were totally unprepared for the series of droughts that often frequent the study area. Railway and government advertising had certainly not mentioned these characteristics, because the advertisers were as equally unknowledgeable about climatic conditions. The railwaymen and homesteaders, upon entering the study area were almost completely ignorant of the length of the frost free period, precipitation amounts, temperature averages, and, above all, the annual moisture deficits that, as homesteaders were to find out, prevent reliable crops on dry land farms.

²Pers. comm. Dr. A. E. Palmer, Lethbridge, October, 1970.

VEGETATION FEATURES

The entire study area falls within the vegetation belt referred to as short grass plains. In an area such as this, where cattle ranching was the earliest economic base, followed by dry-land farming, and later irrigation farming, a knowledge of the carrying capacity or potential of the grasses for grazing or pasture is essential. This knowledge, however, was not available to the ranchers, who first entered the area, as is evidenced by the widespread overgrazing that almost destroyed the natural pastures, and the eventual government limitations on grazing that were imposed.

The homesteaders who entered the study area found nothing but mile after mile of dry, desolate grasslands, which were very short near Medicine Hat, and became longer towards Lethbridge in the west. The only relief from this monotonous vegetation pattern was the occasional cluster of balsam poplar or willow in the stream valleys. Photos 2.1 and 2.2 which were taken in the 1890 to 1900 period, when farming was just beginning in the study area, serve to emphasize the fact that the natural vegetation cover over the region in its pre-agricultural setting, was mainly short prairie grasses, which provided little hinderance to neither homesteaders, surveyors, nor railway construction men. No trees at all were



Photo 1: Natural Grassland, Grassy Lake Lake Area, 1890. Courtesy Glenbow Alberta Institute.



Photo 2: Natural Grassland, Typical of the Taber-Coaldale Area, 1900. Courtesy Glenbow Alberta Institute.

natural to the uplands. The noticeable lack of trees meant that house location, in terms of shelter from the winds, was irrelevant, and the lack of local timber for construction of the farm buildings, caused the homesteader to ship his lumber in by rail and barge from the Porcupine Hills, or Manitoba at a substantially higher cost. Although some sod houses were built and occupied, the soil was found to be too sandy and gravelly for the widespread use of this house type. Some areas, particularly the areas of longer grasses in the western portion of the study area, were suitable for sod house construction, though, because the soil contained sufficient fiber from grass roots, sedges and prairie phlox.

Because the earliest homesteaders arrived only a short time after the establishment of large scale ranching (c. 1880), very little knowledge of the physical conditions had been gained by the ranchers, due to the short duration of their experience in the area. The ranchers were only able to say that the land could be grazed practically throughout the year, because of the short duration of snow cover, and that the grasses, due to lack of precipitation, could not support the large herds that had previously been introduced.

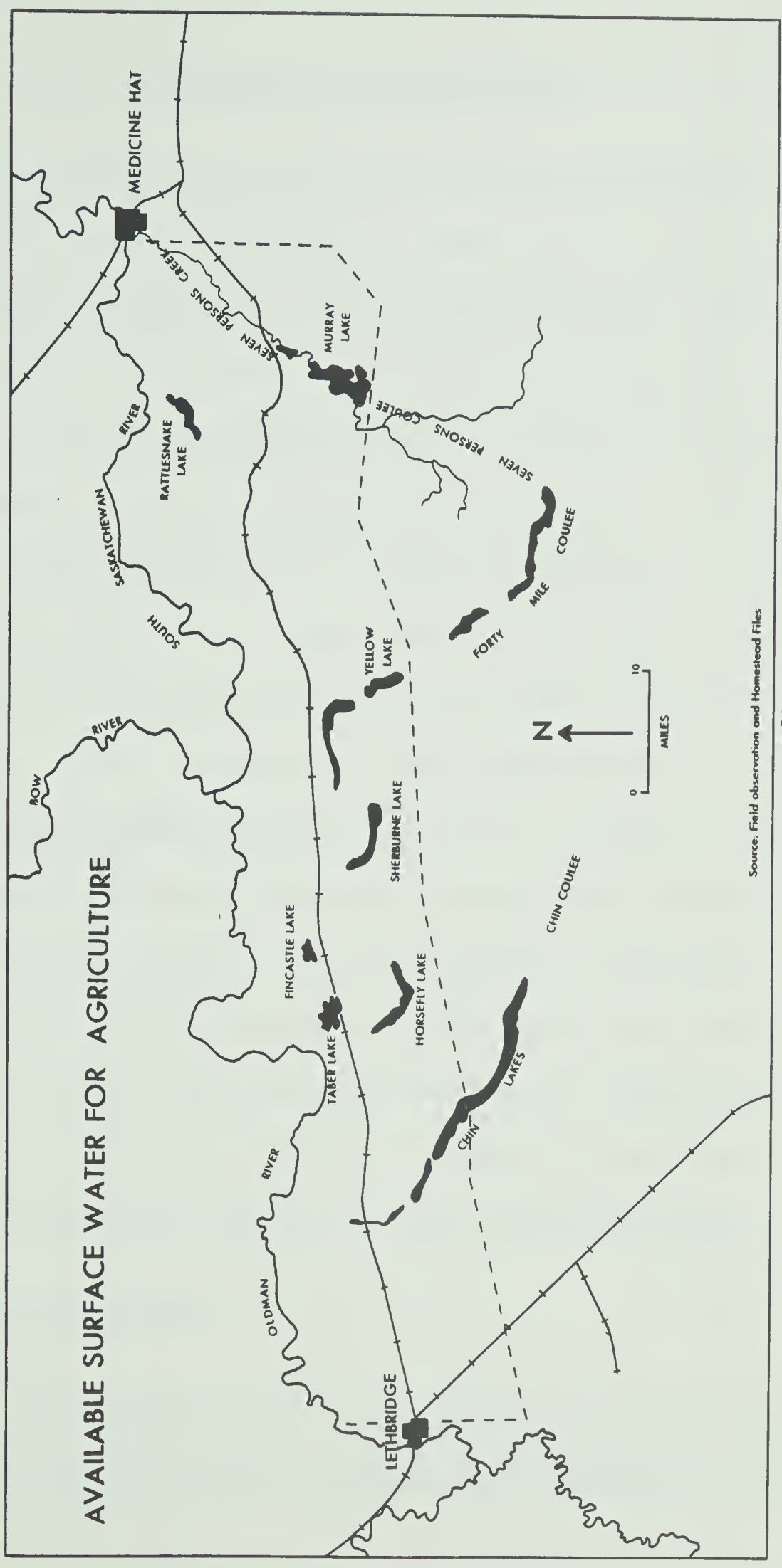
AVAILABILITY OF SURFACE WATER AND THE BUILDING OF WELLS

In a semi-arid region, the presence of available surface water is important in considering the viability of agricultural settle-

ments. The Lethbridge-Medicine Hat study area falls within the semi-arid region of southeastern Alberta, and has been, from the initial stages of settlement, an agricultural district. Under normal homesteading circumstances, where land could be chosen with adequate water for human and cattle consumption, and for plant nourishment, the location of a homestead would be directly related to surface water location. The nature of the land take-up in the study area, however, prevented the normal pattern of homestead location. Homestead advertisements and brochures were distributed throughout the United States and Europe, and were met by a huge response of homestead entry applications. Because of this, the majority of homesteaders, with the exception of railway workers who had already seen the study area, may have entered their quarter sections 'sight unseen.' For this reason, the amount and location of surface water was of little concern - the main concern being just to be able to purchase a piece of land. The homestead advertisements painted such a glorious picture of the land, that prospective settlers were led to believe it contained everything needed for successful farming. Upon arrival of the homesteader and his family onto his quarter section, farming operations began, but were often futile, because of the chronic lack of water. Although various substantial natural water reservoirs were located within the study area, only those homesteads located close to them could benefit from the water.

The homestead advertisements, although they could give little substantial and factual information regarding the physical conditions in the study area, quite often suggested that construction of a well on the homestead would be of definite benefit. The well, in its various forms, was therefore a common convenience, and was constructed almost as a requisite to homestead success, irrespective of the location of the quarter section with reference to surface water. By construction of a well, the homesteader was almost assured of drinking water, even though his crops failed from lack of rain. As experience and climatic conditions dictated, a separate well for stock watering was also often constructed. The lack of knowledge about the unreliability of precipitation and the apparent lack of knowledge or concern for soil conditions, often proved too overwhelming during periods of adverse conditions, and caused disillusionment and homestead abandonment.

Undoubtedly, the situation that faced the homesteader as he settled his quarter section was one of a conflict of perception. He would naturally visualize the study area as an area with ideal environmental conditions, because this is what the C. P. R. and Dominion Government Immigration advertisements suggested, but when it came to the actual environmental conditions of the study area, the immigrant was often totally unprepared.



Source: Field observation and Homestead Files

MAP 2.1

III. SUBSEQUENT INFORMATION

The accumulation of data concerning the settlement process and land use in the Lethbridge-Medicine Hat study area has been made possible through trial-and-error farming methods, and the experience of years of dealing with the natural environmental conditions. Also, the development of precise systems of measuring and recording environmental conditions have enabled us to classify the environmental conditions in a way that was unknown or recognizable during the initial homestead 'rush.' The previous discussion of the physical environment involved the perception of the homesteader or rancher, and left us with little information that could be analyzed and classified to gain an insight into the reasons for land use changes, and the particular order or design of the settlement process. For this reason, further investigation was undertaken using a random selection of homestead files, and any other information that has been subsequently made available. Computing of various types of data has enabled the researcher to measure the relationship between the cultural and environmental conditions.

CLIMATIC CONDITIONS

The Lethbridge-Medicine Hat study area is included in the semi-arid portion of Alberta, having mean annual rainfall amounts,

and mean annual temperatures that approach the lowest and highest, respectively, of the prairie provinces. Average annual precipitation amounts for Medicine Hat and Lethbridge were recorded by G. H. Cutler, "The Climate of Alberta in Relation to Crop Production," using monthly averages for Medicine Hat (1884 - 1919) and Lethbridge (1902 - 1919).³

AVERAGE ANNUAL PRECIPITATION

Medicine Hat	12.79 inches
Lethbridge	15.13 inches

At first glance, these precipitation amounts seem sufficient, but long hours of sunshine, hot temperatures, and the constant winds that are characteristic of the study area, cause excessive evaporation, and decrease the usefulness of the precipitation. By using the Thornthwaite procedures, Dr. A. H. Laycock, (University of Alberta), has calculated the average annual moisture deficit for Lethbridge at 7.9 inches - varying from 13.0 inches to 2.7 inches, and for Medicine Hat, at 11.5 inches annually - varying from 16.4 inches to 0.4 inches.⁴ These calculations indicate an

³D. Diller, op. cit., p. 55.

⁴Bowser, Peters and Kjearsgaard, Soil Survey of the Eastern Portion of St. Mary and Milk River Development Irrigation Project, 1963, p. 11.

average annual precipitation deficit throughout the study area of about 10 inches, with 75 percent of the average annual precipitation falling between April 1 and October 31 (growing season).⁵ Quite obviously, the moisture conditions are sufficiently adverse to make farming a difficult enterprise without proper water storage and distribution. Had the homesteader been aware of this data at the time of initial entry onto his land, he would, perhaps, have instigated some method of irrigation at a much earlier date, to ensure a reliable water supply.

VEGETATION

The native grasses, comprising almost the entire study area before land break-up and cultivation, were blue gamma grass (*Bouteloua Gracilus*) on the drier portions of land, and common spear grass (*Stipa Gomata*) on the remaining land.⁶ These grasses were of definite advantage to both the early rancher and homesteader, as they provided winter pasturage for cattle herds, and very little hindrance to breaking and clearing of the soil for cultivation. Other varieties of grasses existing in the study area, though likely not recognizable by the rancher or homesteader were

⁵Loc. cit.

⁶Nelson and Chambers, Vegetation, Soils and Wildlife, 1969, p. 107.

June grass (*Koeleria Cristata*), Sandberg bluegrass (*Poa Secunda*) and blue joint (*Agopyron Smithii*).⁷ Sedges, moss varieties, prairie phlox and cacti also could have been found prior to initial soil breaking and settlement.

It would seem that the ranchers who grazed their cattle in the study area, gave very little thought to the variety of grasses prevalent there, as long as the grasses provided ample pasturage. With the irregularity of the climatic conditions year by year, likely the growth of natural vegetation varied markedly from year to year as well. Therefore it was difficult for the ranchers to relate climatic and vegetation conditions, or vegetation and soil conditions, to provide a basis of knowledge on the study area that could be useful to the homesteaders who arrived on the scene at a later date.

AVAILABILITY OF SURFACE WATER

The fluctuating yearly precipitation averages that are found in the study area emphasize the fact that the surface water availability is of utmost importance to the agricultural economy based there, even though efficient use of this water was not made until irrigation schemes were developed. It is however, important

⁷Bowser, Peters and Kjearsgaard, op. cit., p. 12.

in the discussion of a settlement process to determine the relationship between distance from available surface water and the ultimate success of the homestead patent. Table II gives an indication of the frequency of successful patents (using 83 quarter sections) at varying distances from available surface water. Distances used were calculated in actual miles from the nearest boundary of each quarter section in the random sample to the nearest body of permanent available surface water. Only the quarter sections (with the exception of two with unknown distances) that were described in the Homestead Files were used. Bodies of surface included: Oldman River, South Saskatchewan River, Murray Lake, Rattlesnake Lake, Chin Lakes, Sherburne Lake, Fincastle Lake, Horsefly Lake, Taber Lake, and Tributaries of the Oldman-South Saskatchewan system.

The frequency of unsuccessful patents at varying distances from the bodies of water indicated on Map 2.1 (page 28) are shown in Table II.

Tables II and III indicate very little relationship between the success of a homestead patent, and location of the homestead in distance from available surface water. The unsuccessful patents are farther than three miles away from surface water, but since no unsuccessful patents are found at five miles or more distance, one

might assume that this data indicate the lack of dependence by the homesteader on available surface water.

TABLE II
FREQUENCIES OF SUCCESSFUL PATENTS AT VARYING
DISTANCES FROM AVAILABLE SURFACE WATER
(Using 83 quarter sections)

Distance	Absolute Frequency	Frequency in Percent of Sample Used	Frequency in Percent at Each Distance
Water on quarter section	8	9.6	100.0
Less than 1 mile	8	9.6	100.0
1 - 1.9 miles	20	24.1	100.0
2 - 2.9 miles	18	21.7	100.0
3 - 3.9 miles	13	15.7	92.9
4 - 4.9 miles	8	9.6	88.9
5 miles and over	6	7.2	100.0
Total	81	97.6	
(Two did not succeed, see Table III).			

TABLE III
FREQUENCIES OF UNSUCCESSFUL PATENT ATTEMPTS
AT VARYING DISTANCES FROM
AVAILABLE SURFACE WATER
(Using 83 quarter sections)

Distance	Absolute Frequency	Frequency in Percent of Sample Used	Frequency in Percent at Each Distance
Water on quarter section	0	0.0	0.0
Less than 1 mile	0	0.0	0.0
1 - 1.9 miles	0	0.0	0.0
2 - 2.9 miles	0	0.0	0.0
3 - 3.9 miles	1	1.2	7.1
4 - 4.9 miles	1	1.2	11.1
5 miles and over	0	0.0	0.0
Total	2	2.4	

PRESENCE OF WELLS

Although distance from available surface water may not have been a determining factor in homestead location (although the Homestead Files do not indicate this), some consideration should be given to the presence of wells that were dug on the homestead, and their effect on eventual success. Of a total of 74 quarter sections, 49 were successfully patented with one well, 10 were successfully patented with two wells, and 15 were successfully patented without

any wells. In the latter case, a variety of reasons may be cited for the absence of a well, including lack of knowledge on how to construct a well, a water table that was too deep and too expensive to reach, or the feeling of the homesteader that sufficient surface water was near enough at hand to warrant not building a well. The data do indicate, though, that the convenience of a well on the homestead was a desirable one, as 79.7 percent of the total quarter sections were equipped with wells, although these were not necessarily essential.

PREVIOUS UNSUCCESSFUL ATTEMPTS AT PATENTING

To determine whether the availability of surface water had any direct relationship on the number of unsuccessful patent attempts for each quarter section, a cross tabulation of these variables was carried out. The final patent attempt listed on the Homestead file for each quarter section was used as the patent for that quarter, and the date of patent also coincided with the final patent attempt, if it was successful.*

*Note: In the Homestead files that applied to the randomly selected quarter sections, more than one patent attempt for each of these quarter sections often occurred. This was the result of a homesteader who, through his failure to successfully carry out the Homestead Act obligations, was forced to abandon his land claim or cancel his entry application. This left that particular quarter section under control of the Crown and thus available for further homestead attempts.

TABLE IV
ABSOLUTE FREQUENCIES OF PREVIOUS UNSUCCESSFUL
PATENT ATTEMPTS AT VARYING DISTANCES FROM
AVAILABLE SURFACE WATER
(Using 83 quarter sections)

Distance	No Previous Unsuccessful Patent Attempts	One Previous Attempt	Two Previous Attempts	Three Previous Attempts
Water on quarter section	4	2	0	1
Less than 1 mile	6	3	0	0
1 - 1.9 miles	16	3	1	0
2 - 2.9 miles	16	0	2	0
3 - 3.9 miles	13	1	0	0
4 - 4.9 miles	4	3	1	1
5 miles and over	3	3	0	0
Total	62	15	4	2

It would appear from the data available in Table IV that the nearness to available surface water had very little apparent relationship with the number of previous unsuccessful patent attempts. The reasons for previous entry cancellations or abandonments must, therefore, have been determined by other circumstances, such as improper methods of cultivation, lack of finances, ill health of the homesteader, or the transient nature of a portion of the homestead population.

SOILS

Four major soil orders are found in the study area:

chernozems (loams, silty loam, sandy loam, silty clay, loam and clay); solonetzic (clay loam, silty clay loam); gleysolic (loam); and regosolic soils (sands). Although these soil orders in themselves give some indication of their agricultural potential, a general classification of the land into 'capability for agriculture' ratings, gives an indication of soil potential that may be viewed more from a perceptive rather than a scientific appreciation. The Institute of Pedology, Alberta Department of Agriculture has classified the soils of the study area into capability for agriculture ratings. Undoubtedly, these qualitative ratings are based on an accumulation of scientific and perceptive knowledge, that has been gathered over a series of about seventy years of farming experience. The trial-and-error agricultural practices over the past seventy years have led to the development of fairly precise definitions of agricultural limitations in the soil capability ratings. Some of the limitations defining different soil capability classifications could have been perceived by the homesteader, such as the characteristics of Class 7 being applied to the slopes of the Oldman River Valley. For the most part, though, these soil capability ratings are the result of many years of observation and farming practice.

Generally speaking, the quality of soil for agriculture decreases from west to east, basically as precipitation averages decrease. 'Soil capability for agriculture' ratings are, in the case of an historical homestead study, more applicable, because they define the soil, or the land, as the homesteader saw it. Since he had little knowledge of such things as sub-soil structure, soil profiles or soil horizons, it seems reasonable that his estimations of soil quality, and management of the land were based on trial-and-error experimenting, and observations of surrounding land use practices. Although investigations into the relationship between homestead success and soil capability ratings produced no definite evidence, the data suggest two rather significant factors;

1. Homestead quarter sections may have been purchased 'sight unseen' by the prospective homesteaders, as patent successes did not noticeably decrease with the diminishing agricultural capability of the soil.
2. The competitive environment of land selection urged the homesteaders to settle and purchase their land, irrespective of the capability of the soils to produce crops. This was perhaps due to a general lack of knowledge of soil classification and agricultural potential. Using the Department of Pedology "Soil Capability for Agriculture" classifications as one variable, and patent results as the second variable, we are able, with cross tabulations, to calculate the extent of their relationship.

TABLE V

FREQUENCIES OF SUCCESSFUL PATENTS IN RELATION
TO SOIL CAPABILITY (Using 83 quarter sections)

Soil Capability Classifications	Absolute Frequency	Frequencies as Percent of Sample Used
1	16	19.3%
2	12	14.5%
3	4	4.8%
4	29	34.9%
5	11	13.3%
6	9	10.8%
7	--	----
Totals	81	97.6%

TABLE VI
FREQUENCIES OF UNSUCCESSFUL PATENTS IN
RELATION TO SOIL CAPABILITY
(Using 83 quarter sections)

Soil Capability Classifications	Absolute Frequency	Frequencies as Percent of Sample Used
1	0	0.0%
2	0	0.0%
3	0	0.0%
4	0	0.0%
5	0	0.0%
6	2	2.4%
7	-	----
Totals	2	2.4%

Tables V and VI indicate that the quality of land apparently had very little bearing on the absolute success or failure of the homestead patent. Had the data revealed a positive correlation, then we would expect a diminishing number of successful patents as soil capability decreased. However, since only 2.4 percent of patent attempts were unsuccessful (Class 6), we can assume that the homesteaders were willing to endure hardships and overcome poor soil characteristics in order to successfully patent their quarter section. The two failures indicated in Table VI are understandable, however, because of the unsatisfactory nature of the soil. Further

investigation revealed that these quarter sections were returned to grazing land. The 33.8 percent of successful patents that occurred in soil Classes 1 and 2, indicate the fertility of the soil, and relative ease of cultivation. Of further significance is the fact that the majority of Class 1 soil is located on the uplands between Lethbridge and Taber, and the early irrigation projects of 1901 - 1910 that were constructed in that region, may have significantly increased the chances for homestead success. The large number of successes found in Class 4 are due to the huge area of this soil type, comprising most of the land between Medicine Hat and Bow Island.

A further insinuation may be the leniency of the obligations to patent a quarter section under the Homestead Act. The rather high success frequencies of soil Classes 4 and 5 (34.9 percent and 13.3 percent respectively) - soil classifications that the Institute of Pedology has stated are very severely limited for crop cultures, indicates that the homesteader, after his entry on to the land, was able to break and crop enough land, almost regardless of the soil quality.

TABLE VII
 NUMBER OF ACRES CROPPED IN EACH SOIL
 CAPABILITY FOR AGRICULTURE CLASS
 FOR INDIVIDUAL HOMESTEADS
 (Using 78 quarter sections)

Acreages	Absolute Frequency of Homesteads For Soil Capability Classes						
	1	2	3	4	5	6	7
0 - 25	3	2	0	2	2	1	0
26 - 50	5	6	2	10	4	4	0
51 - 75	3	1	0	5	1	1	0
76 - 100	1	1	0	4	2	1	0
101 - 150	3	2	1	6	1	1	0
151 - 160	1	0	1	1	0	0	0
Totals	16	12	4	28	10	8	0
Total Acreages Broken	1037.0	629.0	410.0	1932.0	512.0	421.0	0.0
Percentage of Total Acreage In Each Category	20.9	12.8	8.3	39.1	10.4	8.5	0.0

TABLE VIII
NUMBER OF ACRES BROKEN IN EACH SOIL
CAPABILITY FOR AGRICULTURE CLASS
FOR INDIVIDUAL HOMESTEADS
(Using 77 quarter sections)

Acreages	Absolute Frequency of Homesteads For Soil Capability Classes						
	1	2	3	4	5	6	7
0 - 25	2	1	0	0	2	1	0
26 - 50	6	3	2	7	4	2	0
51 - 75	2	6	0	5	1	2	0
76 - 100	3	1	0	7	2	2	0
101 - 150	3	0	1	7	1	1	0
151 - 160	0	1	1	1	0	0	0
Totals	16	12	4	27	10	8	0
Total Acreages Broken	1049.0	725.0	410.0	2182.0	563.0	493.0	0.0
Percentage of Total Acreage In Each Category	19.2	13.3	7.8	40.2	10.4	9.1	0.0

TABLE IX
ABSOLUTE AND PERCENTAGE FREQUENCY OF
SUCCESSFUL PATENTS WITH ACRES CROPPED
(Using 76 quarter sections)

Acreages	Absolute Frequency	Percentage Frequency
0 - 25	9	11.8
26 - 50	31	40.8
51 - 75	11	14.5
76 - 100	8	10.5
101 - 150	14	18.5
151 - 160	3	3.9
Totals	76	100.0

The result of a cross-tabulation of successful patents by the number of acres cropped indicates the great variety of acreages (from 10 acres to 160 acres) cropped on different homesteads, and perhaps indicates the leniency of homestead obligations in which the minimum cropped/broken area each year for three years depended upon the varying knowledge of dry-land farming, ambition and versatility of the homesteader and the fact that a great range of finances was found among the homesteaders.

The Canada Homestead Act was designed to apply to those surveyed areas in Canada, (and particularly the prairie region), which were opened to homesteaders in the initial stages of settlement. This Act was designed to apply to a wide range of terrain and vegetation cover. Other studies (i.e. Stone 1970) have shown that the nature of tree cover (size and density of trees) was an important influence in the selection of quarter section homestead sites in the northern frontiers of the prairie provinces, because the acreage of land that could be broken and cropped was often severely limited by the number of heavy trees.⁸ In the study area, however, the lack of tree cover eliminated any process of homestead site selection, and thus, created comparatively easy patenting conditions. Actual hazards to settlement were then, far more subtle (i.e. the climate) than the tangible difficulties encountered in the tree cover removal. This meant the long term adjustments in the study area, were more outstanding than the short term tree clearing jobs of the north, in the ultimate success of the farming enterprise. In other words, the point of significance lies in the fact that the patent process was a selective hurdle in the northern forested areas, while in the southern grasslands, the test determining ultimate

⁸D. Stone, Process of Rural Settlement in the Athabasca Area, Alberta, (unpublished M.A. Thesis), University of Alberta, Edmonton, 1970.

success, in most instances, came later.

CONCLUSIONS

The method chosen to discuss the physiography of the Lethbridge-Medicine Hat study area was selected to emphasize the fact that the ranchers and settlers who came into the study area during the initial settlement period knew very little about the differences in soil types, availability of surface water, vegetation and climatic conditions that existed. Despite these differences, however, their perception of the area played very little part in the pattern of settlement (i.e. the location and dispersal of homestead applications). On the other hand, the subsequent information, containing scientific calculations and measurements, was used to reinforce the initial perceptive viewpoints, and in some cases, when combined with advances in technology, actually negated some early appraisals of the capability of the land. The ranchers first said the land was good for nothing except grazing; the railway and Government advertising agencies promoted a land of 'Milk and Honey'; the irrigation farmers saw the need for new farming techniques, and have saved the area from reverting to the dry land region, which was susceptible to constant drought conditions. From the combination of the two major types of information previously

mentioned, it is possible to conclude that the settlement process was initially carried out irrespective of environmental conditions, and only after many years of farming and ranching experience, were farming methods used to compensate for the irregularities of soils, vegetation, surface water and climate.

With very little variation in relief over the area, a rather monotonous natural vegetation cover, and the majority of land being a flat, semi-arid area of grassland, one can appreciate the ease with which the study area was entered by the ranchers and homesteaders, and the consequent ease of breaking and cropping the soil. With the unreliability of precipitation, and the high rate of evaporation, the necessity of digging wells, in most cases, was almost immediate, although it did not assure success of the patent. Only after several years of settlement during which time a quantitative appreciation of the climate was built up from accumulated measurements, that the chronic nature of the aridity became evident, stimulating the development of irrigation.

Early travel throughout the area was rather easy in an east-west direction, with the only obstacles being the deeply eroded stream valleys. No hills of an unnegotiable size were found. North-south travel as well was easy, with the exception of the Oldman-South Saskatchewan River Valley, whose banks, incised some

200 to 300 feet in depth, impeded horse and wagon traffic. The difficulty in negotiating these natural barriers was considerable. Roads and bridges linking the north and south banks of the rivers during the initial settlement period were non-existent. Because of this, surface travel northwards out of the study area was greatly hindered, and the river was therefore established as the northern boundary of the study area. Of further importance was the relative ease with which the Crow's Nest branch of the railway was to cross the study area from east to west.

The barrenness of the landscape, and the exposed nature of the first homesteads must also have been, in some cases, very depressing for those people who came from the wooded, more heavily populated areas of Europe and the United States. Certainly the homesteader's first impression of the land in the study area must have been one of loneliness, and an awareness of the immensity of the land.

CHAPTER III

THE COMING OF THE RAILWAY AND ITS EFFECTS ON SETTLEMENT AND LAND USE

THE PRE-RAILWAY ERA

Southern Alberta was, by nature, an area well suited for cattle ranching. From the Bow River south to the International border, and from the Rocky Mountains east to the Cypress Hills were hundreds of thousands of acres of open and relatively flat country, which had, from remote ages in history, provided sustenance for gigantic herds of buffalo. The native grasses were very nutritious, and sufficient water could be found in the scattered sloughs and streams. Grazing could continue throughout the summer and winter because of the sparse snow cover during the winter months, and the deeply eroded gullies, which dissected the plains, provided ample protection from the winds during winter cold spells (although these were noticeably reduced because this area was near to the mountains and felt the effects of warming and drying chinook winds).

The initial movement of traders and trappers into the study area followed along the narrow margins of land close to navigable

water channels, and settlement was, from the start, isolated and slow in progress. The late 1860's saw the beginnings of a cattle industry that had grown sufficiently by the 1880's to provide practically the sole economic base for the entire region of southern Alberta. However, before the establishment of the Northwest Mounted Police Force bases at Fort Macleod and Fort Walsh, in southern Alberta during 1874, ranching was carried on only with great difficulty, because the Indians could not be controlled effectively, and did not hesitate to slaughter range cattle for food.¹ Not only did the Northwest Mounted Police have the Indians to contend with, but they "drove out American whisky traders who were ruining Indian health and morals."² The Indians, under the watchful eye of the Mounted Police were moved in an orderly fashion to parcels of land set aside by the Dominion Government, so that ranching and farming could proceed unhindered.

Prior to 1870, title to the range lands in the Districts of Alberta and Assiniboia had been vested in the Hudson's Bay Company, from the Red Deer River to the Canada-United States border, and from the Continental Divide to western Saskatchewan, by the Dominion Government.

¹F. W. Gershaw, "The Short Grass Area," A Brief History of Southern Alberta, 1956, p. 73.

²J. M. S. Careless, Canada: A Story of Challenge, 1963.

Ranching, as a large scale commercial enterprise, became organized in 1880. At this time, a Government sponsored system of land leasing allowed ranchers to rent up to one hundred thousand acres at \$1.00 per acre as annual rent.³ This first attempt at government control over grazing was short lived, as a new system was established in 1881 by a Federal Government order-in-council.⁴ Under the new system, a grant to individuals or corporations of leases, was not to exceed one hundred thousand acres for a period of twenty-one years. The annual rent was one cent per acre.⁵ Within three years, the lessee was to have placed on the lease one head of livestock for each 10 acres. As more became known of carrying capacity, a decrease of one head to 25 acres was ordered, and eventually, one head to 30 acres. Because of their lack of knowledge of the carrying capacity of grazing lands in the study area, the ranchers had originally perceived these lands as being able to support much larger herds of cattle than was later determined, through trial-and-error experimentation, resulting in a change in perception. The order-in-council was very significant because it had, for the first time, created an upper limit to the number of

³F. W. Gershaw, op. cit., p. 74.

⁴A. Johnston, "A History of the Rangelands of Western Canada, Journal of Range Management, volume 23, No. 1, p. 5.

⁵Loc. cit.

livestock that could be supported on each grazing range. As more became known about the potential of the grazing lands, the cattle industry became progressively more efficient.

The first big ranch - the Medicine Hat Ranch, was finally located on the flat opposite Redcliffe in 1884 by Messrs. Tweed, Finlay, Ewart, with Pearson as the manager. In 1885, two hundred head of shorthorn cattle were brought in from Ontario and located on the ranch, eight miles south of Seven Persons....⁶

Because of the immense size of the cattle ranches of this period (1880 - 1885), and the open range grazing that was quite commonly used, few fencelines or roads were found in the study area. Mrs. A. E. Palmer stated that even as late as the turn of the twentieth century, one could travel from Lethbridge to Winnipeg, without being hindered by very many fences.⁷ This is an indirect indication of the startling isolation of those times.

Until the construction of the railway line connecting Lethbridge and Medicine Hat in 1885, the entire study area remained generally unsettled, with huge tracts of open range grazing land. Few settlers were interested in entering a region with no reliable sources of transportation or communications. Dry goods and farming implements were difficult to obtain and virtually no markets

⁶J. W. Morrow, Early History of Medicine Hat Country, 1923, p. 46.

⁷Per. Comm. Mrs. A. Palmer, Lethbridge.

(except the scattered Police bases) for produce existed. Not until the railway was constructed was any noticeable growth in population evident away from the rivers.

In 1885, all even numbered sections of the grazing land were thrown open for homesteads, preemptions or for sale.* In 1892, notice was given that all leases not providing for homesteading would be cancelled in 1896. This was the 'death blow' to the large ranchers."⁸

THE COMING OF THE RAILWAY

The community of Lethbridge, which was the most important town in southern Alberta in the 1880's, was located on a prairie plateau of about 300 feet above the valley floor of the Oldman River. Because of the outcroppings of coal along the river banks, the town of Lethbridge was originally called 'Coal Banks', a name aptly reflecting the main industry of the town. The coal was at first mined for local markets, but in 1882, Sir Alexander Galt and his associates opened a mine at Coal Banks. They saw the Canadian Pacific Railway terminus at Dunmore Junction, southeast of Medicine Hat,

*Note: To preempt was the act of settling or squatting on federal public lands before the quarter section could be legally applied for under the Homestead Act. Those individuals who preempted quarter sections were given the first option of legally entering and homesteading that land after it became legally available for purchase.

⁸F. W. Gershaw, "The Short Grass Area," A Brief History of Southern Alberta, 1956, p. 76.

as a major market for the coal, but had no way of transferring the coal over the 110 miles to Dunmore. Coal seams were also found at Woodpecker and Blackfoot Crossing.⁹ Some of the coal was sold to the Mounted Police Barracks at Fort Macleod, and some was hauled by wagon to Fort Benton, Montana.

Since the proposed Canadian Pacific Railway crossing of the South Saskatchewan River was to be at Medicine Hat, Galt solved his transportation problem by hauling the coal in river barges from Coal Banks east to the Medicine Hat crossing. Through the initiative of Elliot Galt and his father, Sir Alexander, enough capital was raised to organize a company, the North-Western Coal and Navigation Company, in 1883.¹⁰

The first task of the North-Western Coal and Navigation Company, was to finance and build the river steamers it required. Initial construction began in 1883, and the three steamers operated from that year until 1886, when they ceased to haul coal on the Coal Banks-Medicine Hat run. The Company (N.W.C. and N. Co.) operated with three vessels; the 'Minnow, Alberta and Baroness', and a fourth vessel, the 'Northcote' operated under control of the

⁹Morton and Martin, Canadian Frontiers of Settlement, Volume 2, p. 93.

¹⁰Johnston, Boats and Barges on the Belly, 1966, p. 5.

Winnipeg and Western Transportation Company.¹¹

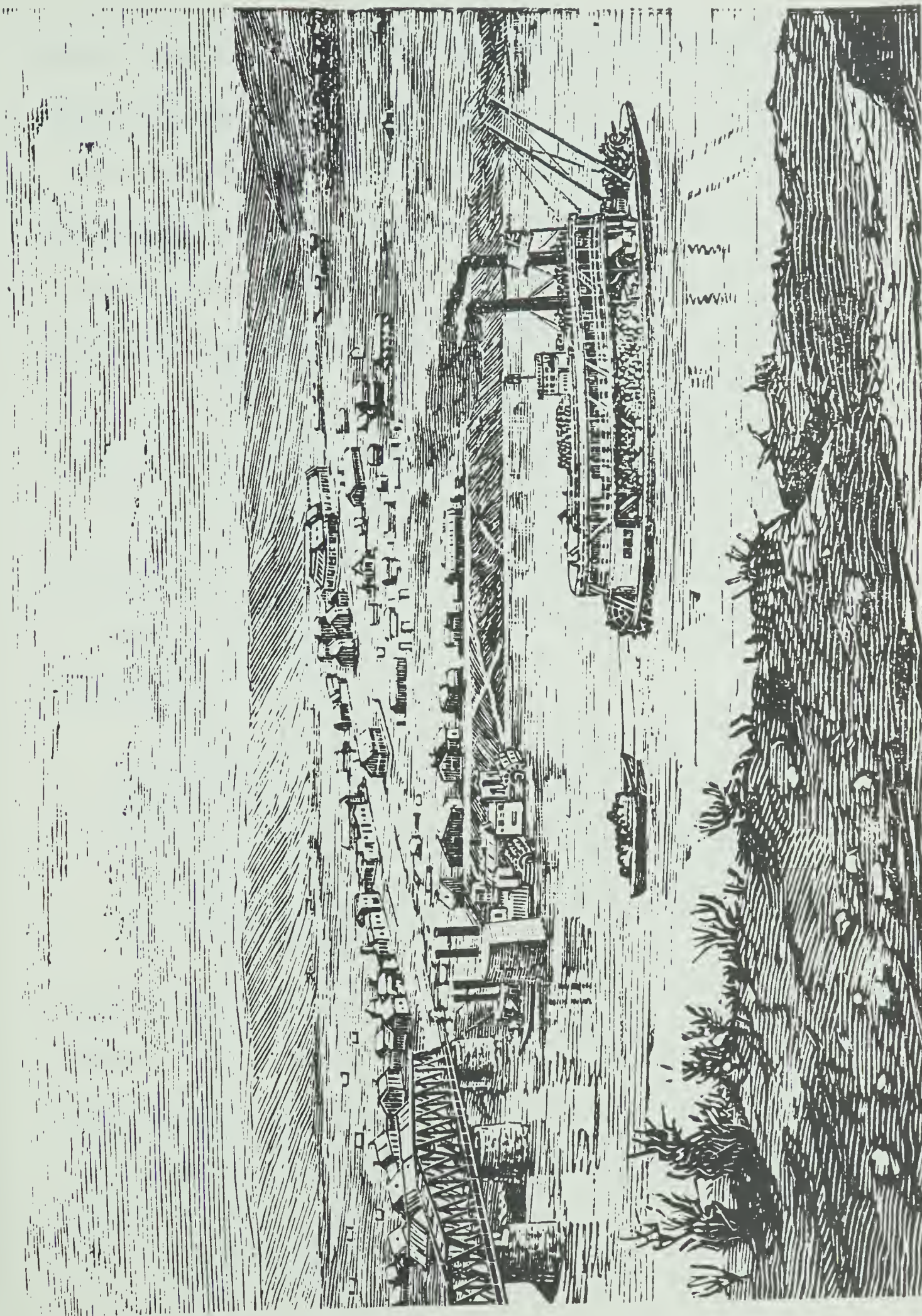


Photo 3: Steamers 'Northcote' and 'Minnow'
at Medicine Hat, 1885. Courtesy
Glenbow Alberta Institute.

The three company steamers were used to haul coal barges until 1885, when they were commissioned as troop and supply carriers for General Middleton in his battles against Riel and the Metis at such places as Batoche and Fish Creek.

During the period of time (1883 - 1885) that the Alberta,

¹¹Ibid, p. 8.



Sketch of the Steamer "Northcote" at Medicine Hat, 1885. Glenbow Alberta Institute.

Photo 4

Minnow and Baroness were used to haul coal barges, they transported a total of three thousand tons of coal from the mines at Coal Banks to Medicine Hat. The only difficulties that arose were the operating expenses, and the briefness of the shipping season. The navigation season on the river, which extended over about seven weeks during spring flood and high water season, proved too difficult to contend with, as not enough coal could be shipped during such a short period of time. The short duration of the navigation season on the Oldman-South Saskatchewan Rivers, led to the abandonment of the Company steamers, and the search for new methods of shipping coal to Medicine Hat. Dr. Dawson, of the Geological Survey Reports of 1882 asserted:

In the autumn, the volume of water is much decreased, and it would not be easy to descend some parts of it in a large flat bottomed boat. During high water, in the early summer, it would probably be possible to make a few trips with a small stern wheel steamer, as far up as Coal Banks, but it cannot be counted on as a means of carrying eastward a large quantity of coal from the fine seams in that vicinity.¹²

The coal that had been shipped to the Canadian Pacific Railway at Medicine Hat proved to be of such great value for steam purposes that a contract was offered to the Company to supply coal to Medicine Hat, if the Company would build a railway connecting the mines with

¹²Ibid., p. 29.

the Canadian Pacific Railway. Sir Alexander Galt (then the Canadian High Commissioner in Great Britain), and his associates proposed to build the railway, and a charter was granted by the Dominion Government in 1884. With this charter was a land grant comprised of two subsidies:¹³

1. Dunmore to Lethbridge - 109.5 miles at 3,840 acres per mile = 420,480 acres.
2. Dunmore to Lethbridge - 109.5 miles at 2,560 acres per mile = 280,320 acres.

The total land grant earned by the Company was 700,800 acres, to be paid at 10 cents per acre. Construction began in April of 1885, and the narrow gauge railway, known as the 'Turkey Track Line' was completed on August 28, 1885.¹⁴

Successful completion of this railway line assured the traffic of coal from Lethbridge, and would as well, divert to the Canadian Pacific Railway, the cattle and mining trade of Montana Territory in the United States. The Alberta Railway and Coal Company line, running south from Lethbridge through Stirling and Cardston to the International boundary, met with the Great Falls and

¹³J. B. Hedges, The Federal Railway Land Subsidy Policy of Canada, 1934, p. 88.

¹⁴"Railway Edition," The Lethbridge News, September, 1890.

Canada Line running north from Great Falls, Montana, to the border. The Alberta Railway and Coal Company, as well, absorbed the North-Western Coal and Navigation Company in 1891, and took control of the Lethbridge-Medicine Hat rail line.



Photo 5: Narrow Gauge Railway, 1885; the "Turkey Track" Line, Glenbow Alberta Institute.

The Alberta Railway and Coal Company narrow gauge line lasted only a short time, as it was leased in 1893 by the Canadian Pacific Railway, and relaid as a standard gauge track. Under the auspices of the Canadian Pacific Railway, this railway line was

extended through the Crow's Nest Pass to Kootenay, British Columbia, increasing the potential market for agricultural goods from the study area. As farming experience in the study area had revealed, as well as a growing awareness of the potentiality of the area for agriculture, large commercial concerns such as the Alberta Railway and Coal Company began to investigate the possibilities of increasing agricultural production by irrigation projects. Crop failures had occurred on occasional growing seasons due to the lack of precipitation, so concern had grown over the fact that these crop failures could, in the future, stymie the agricultural and economic growth of that area. With irrigation interests in mind, the Alberta Railway and Coal Company reorganized itself as the Alberta Irrigation Company, and later as the Canadian Northwest Irrigation Company. This was clearly evidence that a change in perception, due to an increasing awareness of the physical environment in the study area, had affected the energies of the Alberta Railway and Coal Company away from railway freight service towards one of land development, and this proved to be the initial driving force for the development of large scale irrigation projects at a later date. Corporate development of the private railway and irrigation concerns previously mentioned, was completed in 1904 when the Alberta Railway and Coal Company, and the St. Mary River Railway Company

combined to form the Alberta Railway and Irrigation Company.¹⁵

The Canadian Pacific Railway assumed full control and ownership of the Alberta Railway and Irrigation Company lines in 1912, and with this, gained control of all unsold portions of the original railway grants.¹⁶ Because the Alberta Railway and Irrigation Company had been a combination of a variety of interests (including coal, transportation, timber, navigation, ranching and irrigation), its versatility and resourcefulness had a marked influence on the development of southern Alberta.

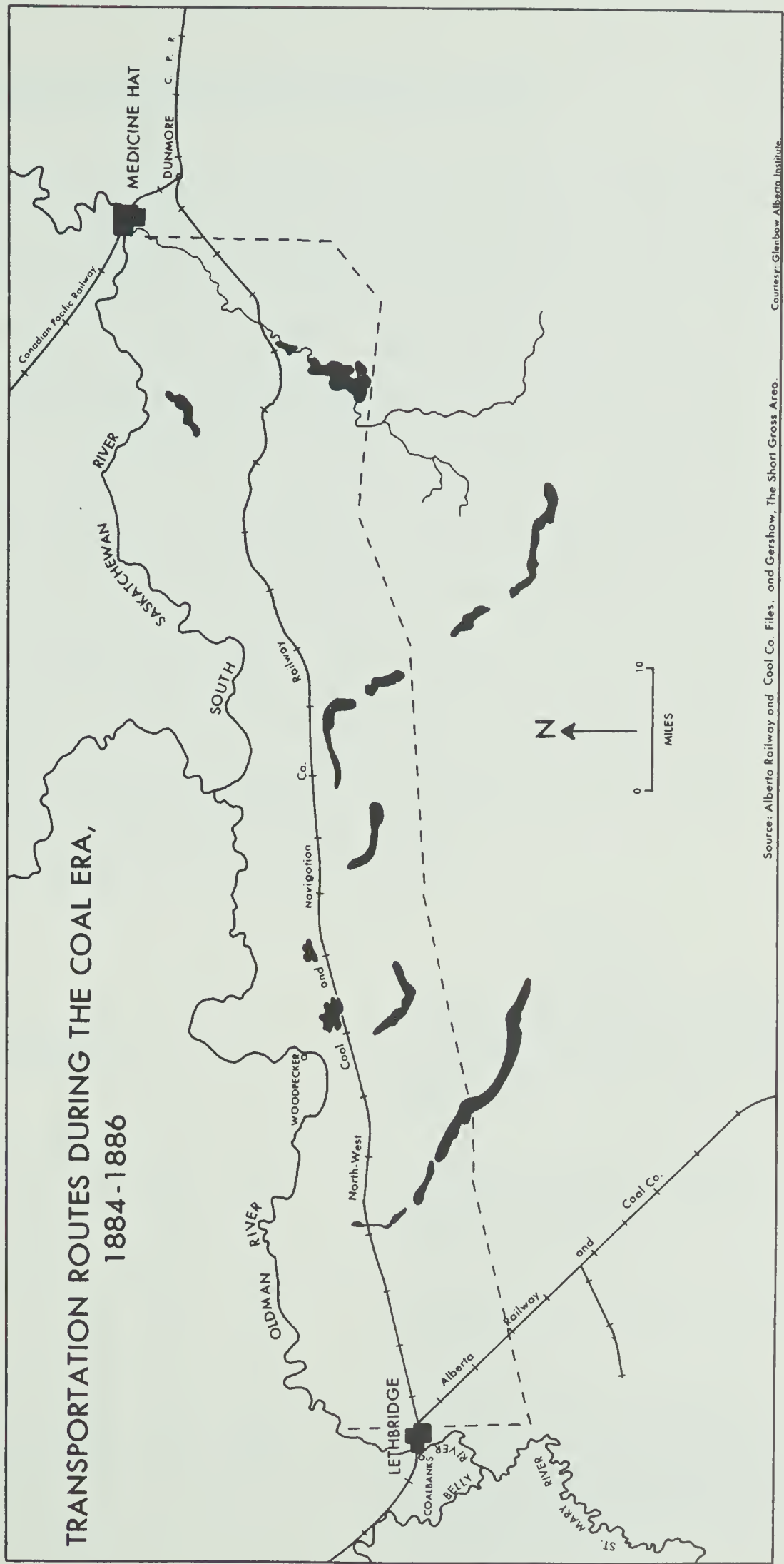
Actual construction of the narrow gauge rail line, the 'Turkey Track,' was beneficial in settling the study area in two ways:¹⁷

1. Armies of laborers were imported to do construction work, and many of them remained as settlers.
2. The demand for labor, generated by the construction jobs, provided part-time work for hundreds of homesteaders.

¹⁵J. B. Hedges, op. cit., p. 88.

¹⁶J. B. Hedges, Building the Canadian West, 1939, p. 60.

¹⁷D. Diller, The Early Economic Development of Alberta Previous to 1905, Unpublished M. A. Thesis, 1923, p. 63.



Source: Alberta Railway and Coal Co. Files, and Gershow, The Short Grass Area. Courtesy, Glenbow-Alberta Institute.

MAP 3.1

AVAILABILITY OF LAND FOR HOMESTEADING:

The Dominion Lands Act (1871) was based on the American Homestead Act of 1862, as it stipulated that the lands in Western Canada would be divided into regular units called townships - each township comprising 36 sections of one square mile each. The sections were numbered from 1 to 36, with section 1 being located in the southeast corner of the township, and the section numbers alternating from east to west and west to east, so that section 36 is located in the northeast corner. The common unit for homesteading was the quarter section of 160 acres. Those lands available for homesteading through the Dominion Government were the even numbered sections of land in each township.

Sections:

Township:						Land open for homesteading: 2, 4, 6, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36.
N						
31	32	33	34	35	36	Canadian Pacific Railway Lands: 3, 5, 7, 15, 17, 19, 23, 27, 31, 35.
30	29	28	27	26	25	
19	20	21	22	23	24	Hudson Bay Company Lands: 8 and 26.
18	17	16	15	14	13	School Lands: 11 and 19.
7	8	9	10	11	12	
6	5	4	3	2	1	Land sold to the Northwest Canada Land Company by the Canadian Pacific Railway: 1, 9, 13, 21, 25, 33.
S						

A quarter section (160 acres) was offered to every settler on condition that he fulfilled three years residence, and the payment of an entry fee of \$10.00. The homesteader could also preempt the adjoining quarter section, which he could buy at \$2.50 per acre, or \$2.00 per acre, depending on location and condition of the land.¹⁸ All odd numbered sections of land were held under land grants to the railway, with exception of Hudson's Bay Company lands (section 8 and 26), and those sections (11 and 19) allotted as school lands. The federal government had no jurisdiction over granting homesteads on Hudson's Bay Company or School Lands, and consequently, these lands were sold privately, as were railway lands, to prospective homesteaders. The sale transactions of these lands were not recorded by the Dominion Government, so no Homestead Files were available for perusal.

RAILWAY SPONSORED SETTLEMENT SCHEMES

The Canadian Pacific Railway was conceived as a national undertaking that was necessary to preserve for Canada the north-western section of this country, and it was also essential in the con-

¹⁸Government of Canada, Department of Agriculture, Guide Book Containing Information for Intending Settlers, 1885, p. 11.

sumation of the national confederation pact between Canada and British Columbia. It was also felt that the transcontinental railway would help to promote colonization and immigration into the prairie region and that this would be followed by the growth of agriculture and forestry. When the Dominion Government granted a Royal Charter to the Canadian Pacific Railway on February 5, 1873, the population of the entire northwest (of Canada) was only 165,000 - hardly enough to maintain the volume of traffic necessary to pay the railway's operating expenses.¹⁹ Thus, before completion of the rail line in 1885, the Canadian Pacific Railway had immigration advertisement in Britain, continental Europe, and the United States. "At that time, however, the American mid-west was, itself, seeking settlers, and there was little hope of attracting immigrants from that source."²⁰ In Great Britain, Canadian Pacific Railway advertising had commenced in the early 1880's, with the display of pamphlets and agricultural produce from the Canadian northwest. This ushered in a period of intensive land settlement that lasted for about thirty years, and was designated as being primarily agricultural. To induce settlement, the Canadian Pacific Railway lands

¹⁹J. C. Bonar, The Canadian Pacific Railway and Its Contributions Towards the Early Development and to the Continued Progress of Canada, vol. 1, 1950, p. 16.

²⁰J. C. Bonar, The Canadian Pacific Railway and Its Contributions Towards the Early Development and to the Continued Progress of Canada, vol. 1, 1950, p. 1.

sold for a meager rate of \$2.50 per acre, with the stipulation and one-half of the land must be broken and cultivated. The Canadian Pacific Railway would then grant a rebate of one-half the purchase price (\$1.25 per acre) for all cultivated land.²¹ Thus, the very terms of the Homestead Act obliged the new farmer to crop the land as quickly as possible. To do this effectively required horses, which in turn utilized pasture and winter stored grains. Therefore, the initial farm activities placed heavy emphasis on re-cycling of farm produce, which was, in its crudest form, the establishment of a subsistence economy.

The evidence presented in Table X strongly suggests the presence of a mixed farming economy during the initial settlement period. A subsistence agricultural economy, as defined by Whittlesey, is one where the total agricultural produce is consumed on the farm, and is necessary for the survival of that farm.²² According to this definition, the study area did have a subsistence, mixed farming economy. This basic, mixed type of farming, involving both stock raising and crop production was widely practiced in

²¹ Ibid., p. 2.

²² D. Whittlesey, "Major Agricultural Regions of the Earth," from Wagner and Mikesell, Readings in Cultural Geography, 1962, p. 416.

TABLE X
ABSOLUTE FREQUENCY OF HOMESTEADS
WITH HORSES, CATTLE AND HOGS
(Using 83 quarter sections)

Type of Stock	Absolute Frequency
No stock	15
Horses	2
Horses and cattle	18
Cattle	3
Cattle and hogs	2
Hogs	1
Oxen	2
Horses, cattle, hogs	6
Unknown	36
Total	85

the study area, and continued so, until farmers had established themselves, and were able to participate in more lucrative and specialized methods of dry land farming (i.e. wheat farming), and irrigation farming.

The Canadian Pacific Railway, in affiliation with the Government of Canada (Department of Agriculture), published a Guide Book Containing Information for Intending Settlers, in 1885. Glowing, optimistic reports could be found that pertained to the invigorating prairie climate, the fertile soil, and the wide open spaces that would

provide welcome relief from the crowded living conditions and social and economic grievances that prevailed in Europe. Because the Government and the Canadian Pacific Railway were sincerely interested in the future development of the west, their perception of this region was almost one of an agricultural utopia. Their lack of knowledge of the climatic conditions, and particularly the chronic surface water shortage, did not allow them to discuss, in any advertisements, the possible hazards to homesteading in such arid regions as the study area, so the average European, as a prospective homesteader, perceived this region of southern Alberta as being absolutely ideal for agriculture, and for a new home. In many cases, consequently, homesteaders arrived unprepared for the conditions that existed in the study area, and after a short period of fruitless farming attempts, or a year of drought, they were forced to abandon their homestead claim. So thorough were some of the Canadian Pacific Railway advertising brochures that they even played on the emotions of the sportsman and hunter, with hopes that these people would investigate settling on the Prairies. "Foremost among the attractions for sportsman may be placed buffalo hunting on the vast prairies of the Northwest... ." ²³ Of the District of Alberta, (1885), the Guide Book

²³ Government of Canada, Department of Agriculture, Guide Book Containing Information for Intending Settlers, 1885, p. 31.

was very generous in its advertising scheme. The study area was found in the heart of this district. "Nature has been lavish in its gifts to the District of Alberta. A great portion of this district being immediately under the Rocky Mountains, has scenery of magnificent beauty... ."24

This district may also be said to be preeminently the dairy region of America. Its cold clear streams and rich and luxuriant grasses make it a very paradise for cattle. This is at present the ranch country.²⁵

The Canadian Pacific Railway Company during the past season (1884) caused a series of experimental farms to be tried without any special selection of site, the places being chosen for convenience near the railway stations, which are placed at fixed distances from each other. The result of these experiments in every case without exception was luxuriant crops of wheat and other grains, and vegetables of every kind put down.²⁶

It seems quite obvious that the purpose of these advertisements was to play on the emotions of people in England and Western Europe, who were living in the crowded, dirty, and fast growing urban centers, or to the peasant farmers, who were just able to survive and support their families by selling small amounts of produce in urban markets.

²⁴Ibid., p. 85

²⁵Loc. cit.

²⁶Ibid., p. 87

INFLUX OF SETTLERS

The effects of the advertising policies of the Dominion Government and the Canadian Pacific Railway can be seen in the number of settlers emigrating to the prairies.²⁷

	<u>1871</u>	<u>1881</u>	<u>1891</u>	<u>1901</u>	<u>1911</u>	<u>1921</u>
N.W.T.	48,000	56,446	98,967	20,129	6,507	8,143
Alberta	-----	-----	-----	73,022	374,295	588,454
Saskatchewan	-----	-----	-----	91,279	492,432	757,510
Manitoba	25,228	62,260	152,506	255,211	461,394	610,510

Following the pre-railway period (1851 - 1881), when immigration was not excessively high, we can see a definite rise in immigrant numbers due to the various advertising policies. A decrease during 1891 - 1901 followed the initial rush of homesteaders. The sharp increase in numbers during the 1901 - 1911 period was due to various reasons:

1. overcrowding of the American west
2. end of the Boer War, and the return to Canada of many war veterans
3. continued land advertising policies.

Although none of the homestead entries selected in the random sample were applied for under the Soldier Settlement Scheme, the writer

²⁷Dominion Bureau of Statistics, Population, vol. 1, 1951.

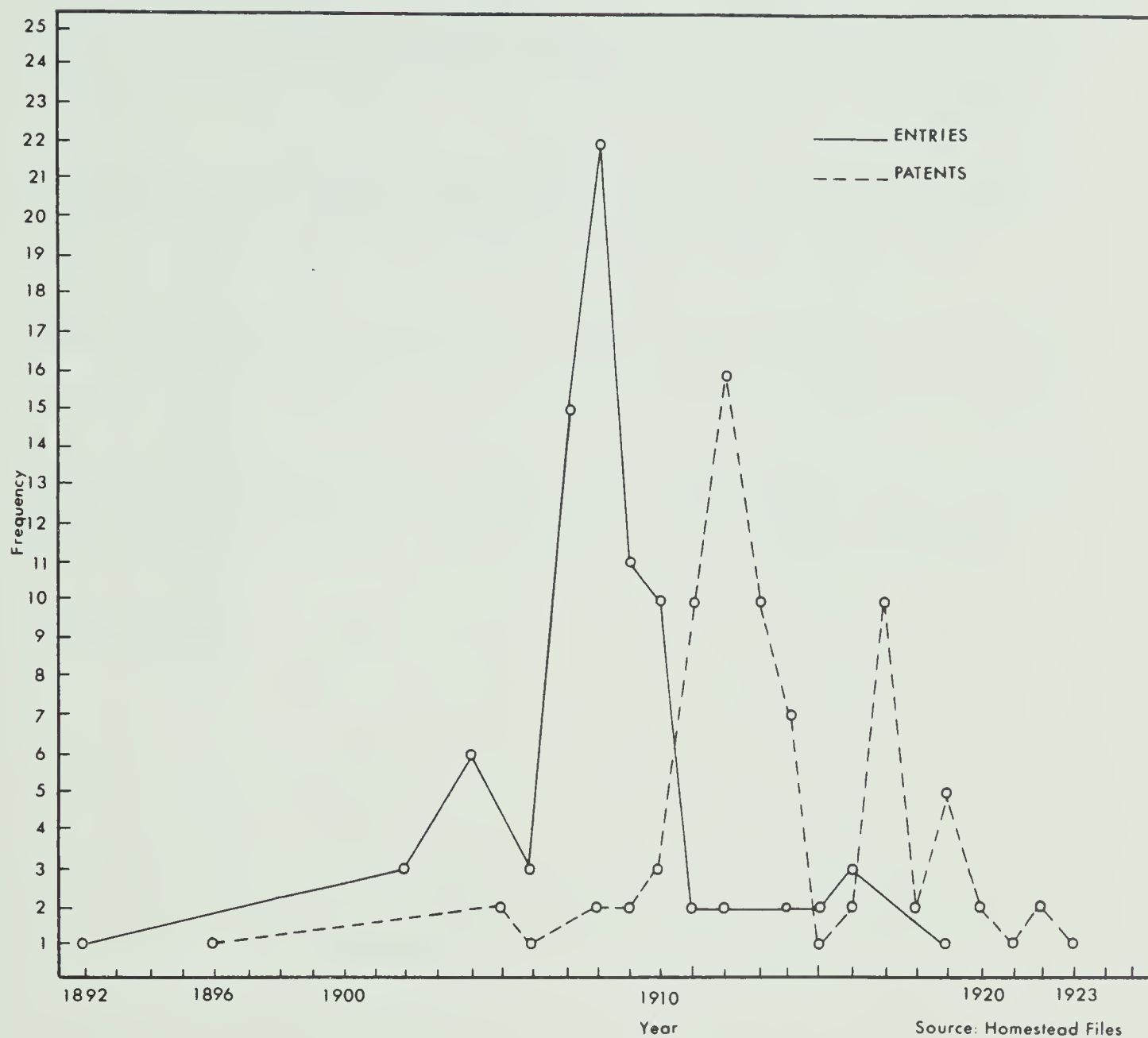
found evidences of other quarter sections in the study area that were entered and patented under the terms of this particular type of land grant. A closer look at the frequencies of homestead entries and patents for different years following 1892 and 1896, respectively, gives an indication of the years when settlement was most prevalent within the study area.

From Figure 3.2, it is quite evident that the years of greatest significance in terms of homestead entries were 1905 (15 entries), 1908 (22 entries), and 1909 (11 entries). This may be due to renewed interest in homesteading through C.P.R. advertising; the C.P.R. experimental farms which produced new varieties of quick-maturing agricultural crops; and thirdly, the introduction of Marquis wheat, a new variety developed by Sir Charles Saunders, in 1907, that matured a week to 10 days earlier than varieties previously used.²⁸ With this development, wheat growing became a more profitable and reliable activity in an area with a short growing season of about 120 days.

A considerable drop in the number of entries per year following 1910 is an indication that the settlement 'boom' was coming

²⁸N. L. Nicholson, "The National Government and Development," from J. Warkentin, Canada, A Geographical Interpretation, 1967, p. 182.

FIGURE 3.2 ABSOLUTE FREQUENCY OF ENTRIES AND PATENTS (by year)*



* The first entry and patent years of those homesteads used in the random sample were 1892 and 1896 respectively.

to an end, and that most of the more desirable land had been occupied. According to the percentage frequencies of entries and patents (Tables XI and XII), one can see that the peak patent years (1911 - 1914) follow the peak entry years by consecutive four year intervals. The briefness of this period to patent is an indication of relatively successful agricultural schemes and farming operations. Homesteaders were able to patent their entry more quickly because of the absence of dense forest, the development of hardier plant varieties such as Marquis wheat, and the irrigation projects that had been developed in the Lethbridge, Taber and Bow Island districts greatly improved the success ratio of farming enterprises.

TABLE XI
PERCENTAGE FREQUENCY OF ENTRIES BY THE YEAR
(After 1892)

Year	Percentage Frequency	
1919	1.2%	
1916	3.5%	
1915	2.4%	
1914	2.4%	
1912	2.4%	
1911	2.4%	
1910	11.8%	
1909	12.9%	peak years
1908	25.9%	
1907	17.6%	
1906	3.5%	
1904	7.1%	
1902	3.5%	
1892	1.2%	
	2.4*	
Total	100.0%	

*Two missing entry dates comprise 2.4% of the sample.

TABLE XII
PERCENTAGE FREQUENCY OF PATENTS BY YEAR
(After 1896)

Year	Percentage Frequency	
1926	1.2%	
1922	2.4%	
1921	1.2%	
1920	2.4%	
1919	5.9%	
1918	2.4%	
1917	11.8%	
1916	2.4%	
1915	1.2%	
1914	8.2%	
1913	11.8%	peak years
1912	18.8%	
1911	11.8%	
1910	3.5%	
1909	2.4%	
1908	2.4%	
1906	1.2%	
1905	2.4%	
1896	1.2%	
	5.9%*	
Total	100.0%	

*Five missing patent dates comprise 5.9% of the sample.

Note: Uneven intervals occur between the years listed in both Table XI and Table XII, because homestead entries and patents, respectively, in the random sample, were not taken out in certain years, so those years were omitted from the tables.

EFFECTS OF DISTANCE FROM THE RAILWAY

Table XI indicated the pattern of homestead intensity in the study area following initial railway and Government advertising schemes. Since the study area was the scene of a relatively short period of homesteading (about 30 years), it might be questionable whether the railway itself became the focus of the settlement pattern. If this was the case, the distance of homesteads from the railway line should have a direct bearing on the density and success of homesteads and the chronology of land selection. If the railway was influential, it would seem quite natural for the homestead density and success to be greater nearest to the railway because the railway in this case was the only quick and reliable link with the more densely populated market and supply areas of southern Manitoba, Ontario and Quebec. A positive correlation should also occur between the dates of entry and patent, and the distance of the homestead from the railway. Using 76 quarter sections, for which the basic information was recorded, Table XIII gives the absolute and percentage frequencies of successful patents at varying distances from the railway.

TABLE XIII

ABSOLUTE AND PERCENTAGE FREQUENCY OF
SUCCESSFUL PATENTS AT VARYING
DISTANCES FROM THE RAILWAY
(Using 76 cases)

Distance	Absolute Frequency	Percentage Frequency
Less than 1 mile	11	14.1%
1 - 1.9 miles	12	15.5%
2 - 2.9 miles	9	11.5% - 1 unsucce-
3 - 3.9 miles	9	11.5% ssful (1.3%)
4 - 4.9 miles	11	14.1%
5 - 5.9 miles	11	14.1%
6 - 6.9 miles	9	11.5% - 1 unsucce-
7 - 7.9 miles	4	5.1% ssful (1.3%)
Total	76 2 = 78	97.4 2.6 = 100.0%

It is interesting to note, though of no statistical significance, that the only two recorded failures occurred at distances greater than three miles from the railway. According to Table XIII, the successful-unsuccessful patent ratio was not affected by distance from the rail line, until a distance of three miles had been reached. Doubtless, the uniformity of the terrain and the relative ease of travelling over the flat, grassy plains tended to reduce the importance of proximity to the railroad as an influential factor in absolute success or failure of the homestead quarter section. Under these

conditions, homesteaders would be less hesitant to regularly negotiate a greater distance (6 or 7 miles) than those who homesteaded in the forests farther north. The density of homesteads, according to Table XIII has very little variation in each distance category, again reflecting the apparent lack of concern by homesteaders for the distance of their farm from the railway (up to a distance of 8 miles or so).

Using 30 quarter sections, randomly chosen from the original total random sample of Homestead Files, it becomes obvious that very little relationship occurred between the year of entry onto the land, and the distance of the homestead from the rail line. In this case, the data refute any suggestion that land nearest the railway was entered first, followed later by quarter sections farther removed from the tracks. This again suggests the urgency and eagerness of homesteaders to obtain a piece of land, quite often "sight unseen."

TABLE XIV

RELATIONSHIP BETWEEN YEAR OF HOMESTEAD ENTRY,
FREQUENCY OF ENTRIES IN EACH YEAR, AND
DISTANCE FROM THE RAILWAY

Date of Entry	Absolute Frequency of Entries	Distance in Miles From the Railway
1892	1	7.0 miles
1902	1	4.5 miles
1902	1	4.0 miles
1902	1	1.0 miles
1906	1	1.5 miles
1907	1	on railroad
1908	1	on railroad
1908	1	.5 miles
1908	1	2.5 miles
1908	1	3.0 miles
1908	1	4.5 miles
1908	1	5.0 miles
1908	1	6.5 miles
1908	1	7.0 miles
1908	2	7.5 miles
1908	1	8.0 miles
1909	1	1.0 miles
1909	1	2.0 miles
1909	1	4.0 miles
1909	1	6.5 miles
1909	2	8.0 miles
1910	1	3.0 miles
1910	1	3.5 miles
1910	1	5.5 miles
1910	2	6.0 miles
1912	1	.5 miles
1915	1	2.5 miles
30		

Note: The month of land take-up during 1908 was not always included, or could not be read on the Homestead File microfilms, so the fact that distances grade away during 1908 does not mean the homestead entries closest to the railway were taken up first.

Because of the variety of conditions under which land was homesteaded, including such factors as past experience, finances available, size of family, and the condition of the land, it was difficult to show the relative success of the homesteader, measured in time taken to patent. For the majority of cases, the homestead patent was successfully obtained after a period of three to five years; however, in some cases, the time to patent was as much as 18 years, again depending on extenuating circumstances. Table XV indicates the frequency of patents according to the number of years before the patent was achieved, following the entry date (using 85 cases).

TABLE XV

FREQUENCY OF HOMESTEADS IN YEARS TO PATENT

Number of Years to Patent	Absolute Frequency of Patents	Percentage Frequency
1	1	1.2%
2	1	1.2%
3	15	17.6%
4	24	28.2%
5	18	21.2%
6	6	7.1%
7	1	1.2%
8	5	5.9%
9 and over	9	10.8%
unknown	5	5.9%

Note: According to the Homestead Files, there was little relationship, such as distance from the railway, available surface water, family size, or amount of finances for improvements, among those homesteads taking longer to patent.

EFFECTS OF DISTANCE FROM TANK TOWNS

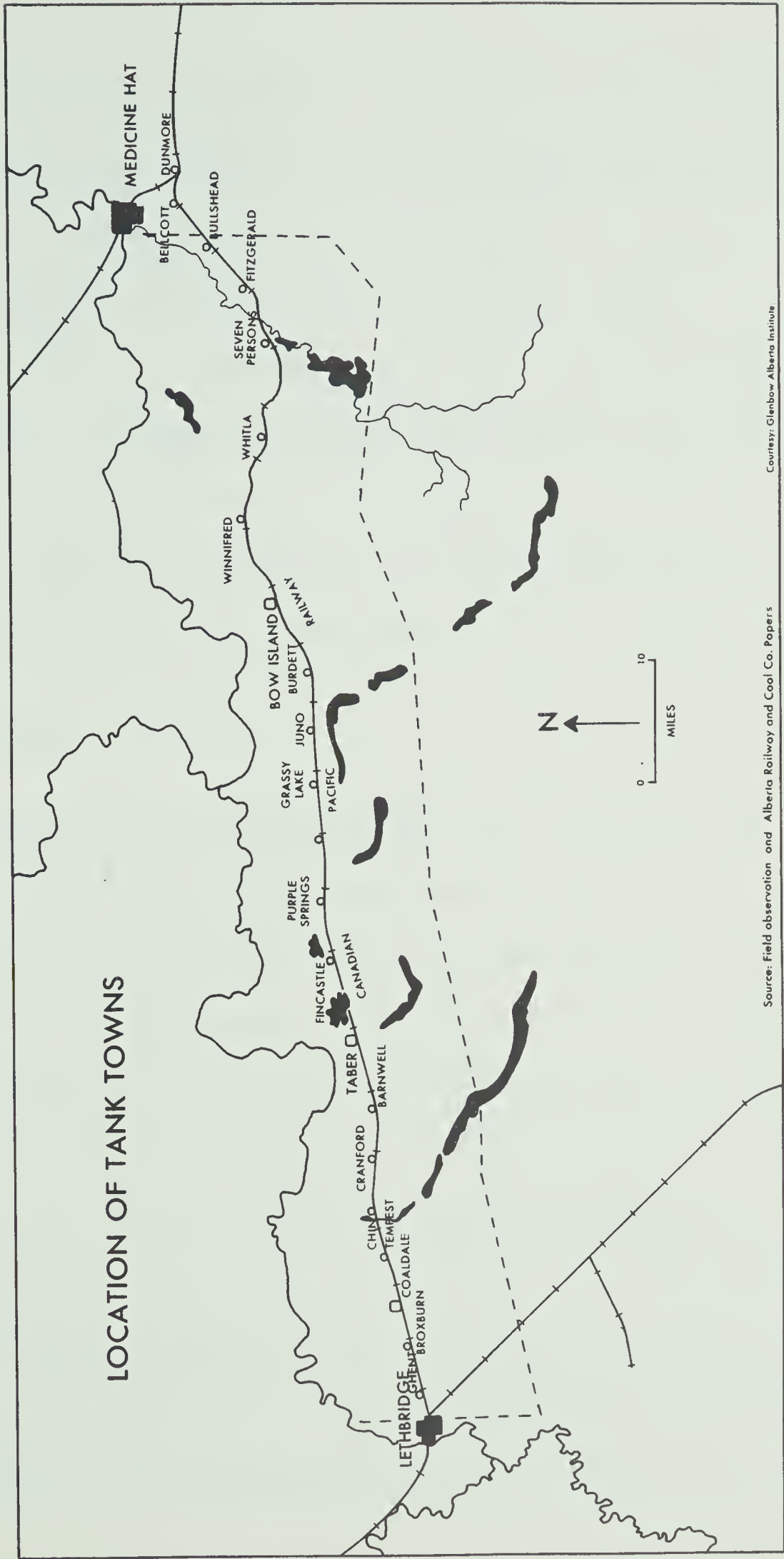
Steam powered locomotives were in common use during the latter part of the nineteenth century, and they remained in operation until the arrival of the diesel train engine on the scene in the 1940's and 1950's. Because of the enormous water and wood/coal requirements necessary to drive their steam locomotives, the Canadian Pacific Railway Company built at regular intervals of about 7 to 10 miles apart, small towns designed to supply the necessities for steam power and provisions to make the railway a profitable venture. These towns became known as 'Tank Towns,' because they held reserves of water needed to fill the tanks on the steam locomotives. Many of these 'tank towns' grew in population as their economic base became more diversified, and they became active centers within farming communities. Other 'tank towns' died out, as their importance to the railway diminished. Within the study area, the towns that thrived included Coaldale, Taber, Grassy Lake, and Bow Island. Other 'tank towns' along the rail line that have not grown noticeably because their economic base was not expanded are Chin,

Cranford, Barnwell, Fincastle, Purple Springs, Burdett, Whitlaw and Seven Persons. The 'tank towns,' previously mentioned that have achieved reasonable growth did so because their economic base expanded, and they became supply and market depots for nearby farming areas. Their importance to the new homesteading areas was great from both a social and economic standpoint. They served as market outlets for agricultural surplus sent on the railway, and enabled the homesteaders to buy goods that had been shipped in by rail. Secondly, the 'tank towns' served as social centers, where individuals from farms that were quite isolated from one another could get together. Such events as the monthly dances, turkey shoots, and whist drives, were looked forward to with great anticipation, and have survived in some small towns to the present day. As the population of a 'tank town' grew, it was able to provide an expanding market for locally produced agricultural products. The importance of nearness to these 'tank towns' can be seen in Table XVI which compares successfully patented homesteads with various distance categories.

TABLE XVI
CROSS TABULATION OF SUCCESSFUL PATENT RESULTS
BY DISTANCE FROM TANK TOWNS SHOWING
ABSOLUTE AND PERCENTAGE FREQUENCIES
(Using 83 cases)

Distance	Absolute Frequency	Percentage Frequency
Less than 1 mile	10	12.3%
1 - 1.9 miles	11	13.6%
2 - 2.9 miles	11	13.6%
3 - 3.9 miles	7	8.6%
4 - 4.9 miles	8	9.9%
5 - 5.9 miles	14	17.3%
6 - 6.9 miles	9	11.1%
7 - 7.9 miles	3	3.7%
8 - 8.9 miles	2	2.5%
9 - 9.9 miles	2	2.5%
10 miles and over	4	4.9%
Total	81	$97.6 + 2.4^* = 100.0\%$

*Note: 2.4% represents unsuccessful patent attempts.



Courtesy: Glenbow Alberta Institute

Source: Field observation and Alberta Railway and Coal Co. Popers

MAP 3.3

The ultimate dependence of patent success on the distance of the homestead from a 'tank town' is not outstanding, but seems to be more directly related than it does to the distance from the rail line itself. Although the two failures occurred 3 and 7 miles out from the tank town, these are to be weighed against the homesteaders who, even though more than seven miles from town, were able to successfully patent their land. Again it is clear that proximity to the tank towns did not have a strong bearing on the chances of ultimate success in land take-up.

CONCLUSIONS

Although the Lethbridge-Medicine Hat railway was not primarily constructed to aid settlement and homesteading, its existence came to have a profound effect on both settlement and land use. The purpose of the railway, which at first was to haul coal for the Canadian Pacific Railway, gradually shifted to one of aiding in the settlement and development of the vast open plains in the study area. Had the various companies that controlled this rail line during its infancy been interested only in the commercial aspects of hauling coal, then the entire study area would, perhaps, have seen a continuance of large scale cattle ranching, and a noticeable retardation of homesteading and farming activities. The railway

construction crews that remained to establish homesteads, and to develop the 'tank towns,' became the core groups within the thousands of settlers who later emigrated to southern Alberta. Lured by railway and Government advertising, immigrants were told of wide open spaces with room to grow, excellent agricultural prospects, and above all, a chance to establish a life that was free from all the social and economic injustices abounding in Europe at that time. The settlement pattern of the study area, and the changes in land use following the initial settlement period were a result of the changes in perception that characterized the different stages of development. As the ranchers first entered the area from the United States in the early 1880's, they saw extensive grazing lands that they thought could support huge herds of cattle. However, they found after experience that the semi-arid grasslands were suited only to controlled grazing conditions. Government agriculturalists as well, were unaware at first of the carrying capacity of the land, for they ultimately had to enforce control measures for grazing on land that had originally been thrown wide open for large scale ranching. From the standpoint of quantity of land made available for grazing, a more rigid maximum stocking rate was introduced. This was important, as well, in preventing land from being held as a speculative venture with no stock on it at all.

Perception change in the study area again changed with the first coal mining ventures. Miners saw the area as having a useful resource in the form of coal, that could be exploited for reasonable profit. This brought about a type of riverine settlement, with a concentration of individuals along the river valley at exposed coal seams (Coal Banks, Woodpecker, etc.). The need to find suitable markets for the coal, led to the concentration of activity along the Oldman-South Saskatchewan Rivers in the form of paddle wheelers and barges to haul the coal. A realization of the shortcomings of river transport led to the construction of the 'Turkey Track' railway, which in turn, not only carried coal to the Medicine Hat market, but helped initiate a wave of agriculturalists. Many of these people were able to successfully patent their homestead claim, but many others, led on by the 'milk and honey' immigration advertisements, came into the study area totally unprepared for the conditions existing there, and they were soon forced off their land, through adverse climatic conditions, or improper farming methods. Those who did stay found the area to be subject to periodic droughts and crop failures, and came to realize that much of the land could only be farmed successfully if irrigation measures were used. The demand for irrigation soon lured a new type of entrepreneur to the area - the commercial irrigation companies, who, through their

efforts were able to control the water supply, and thus create a new agricultural industry that would stabilize the existing output from a struggling mixed enterprise. With the initial wave of homesteaders, came the destruction of large scale ranching, because grazing lands were subdivided into homestead quarter sections. The irrigation areas witnessed a further change to small area farms that were very productive due to high intensity of cropping, and efficient farming methods.

Analysis of the effects of distance of homesteads from the railway line and the 'tank towns,' indicate that proximity to these cultural features was, for the most part, unimportant, and that the overriding factor of concern to the prospective homesteader was his anxiety to obtain a piece of land which he could work and eventually call his own, irrespective of its nearness to either town or track. There was very little substantiation from the Homestead Files of any direct chronological distance correlation occurring. This supports the writers belief that apart from the railroad laborers working in the area, homesteaders, for the most part, entered their land 'sight unseen,' and with an eagerness and spirit of independence that, for the most part, offset any locational disadvantages. On the other hand many of those who failed to patent land, walked off first class land close to both towns and railway, leaving it available for a new settler.

In summary, two factors concerning initial land take-up should be considered. The success of most settlers in patenting their land, within the confines of the existing agricultural technology of that time, was rather outstanding. Their understanding of the environment, though, did not allow them initially to adapt their farming methods to produce a more stable farm economy. However, years of farming experience in the area eventually induced a stability in agriculture, and innovations such as irrigation projects.

Note: The Homestead Files gave no indication of railway workers being more selective of the land they chose to homestead, than other homesteaders. The writer could only suggest that railway workers - turned homesteaders - were caught up in the flurry of land take-up, much the same as were any other prospective homesteaders, since homestead entry applications had to be approved by the Dominion Government land officials.

CHAPTER IV

CULTURAL EFFECTS ON SETTLEMENT AND LAND USE

INTRODUCTION

Following the completion of the Lethbridge-Medicine Hat rail line, the Canadian west witnessed an expansion of land settlement that, for such a short period of time, was unsurpassed, even by the opening of the American west.¹ This mass immigration was not the first to be witnessed in the study area, however, as many cattlemen from the American west had migrated into western Canada during the 1870's and the early 1880's, following the opening of cattle ranges to homesteaders in the Western states during the 1860's. Had branch line railroads such as the Lethbridge-Medicine Hat line not come into existence, then large scale cattle ranching might have survived as the main industry in southern Alberta. The railway, however, decided the fate of the ranching industry, as it encouraged a mass influx of homesteaders into the Canadian prairies.

¹J. C. Bonar, The Canadian Pacific Railway Company and Its Contributions Towards the Early Development and to the Continued Progress of Canada, volume 5, 1950, p. 5.

EFFECTS OF THE HOMESTEADER'S PLACE OF BIRTH

The closing of the American frontier, and the effects of railway and Government sponsored immigration schemes could be seen in the great variety of birth places that were represented among the initial movement of homesteaders into the study area. The lure to buy a parcel of land for the entry fee of \$10.00 had its effects as well on the development of this last true North American prairie frontier.* Although the majority of immigrants into the study area were Europeans, many Mormons left the irrigated farms of central Utah and Idaho (1887), to seek a new life and establish new Mormon colonies in southern Alberta.² As well, severe droughts and crop failures in the Dakotas caused a mass exodus of dry-land farmers from there to southern Alberta, where environmental conditions were thought to be better suited to farming. From data obtained in the Homestead Files, the distribution of places of origin among a homestead sample of 79 quarter sections can be seen in Table XVII.

*Note: Birthplace is used rather than ethnic origin, because in some cases, people of European ethnicity were born in the United States.

²J. Lehr, Mormon Settlements in Southern Alberta, unpublished M. A. Thesis, 1971, p. 2.

TABLE XVII
 FREQUENCIES OF DISTRIBUTION OF PLACES OF
 ORIGIN REPRESENTED BY HOMESTEADERS
 IN THE STUDY AREA
 (Using 79 quarter sections)

Place of Birth	Absolute Frequency	Frequency in Percent of Sample Used
England	23	29.1
Canada	6	7.6
United States	25	31.6
Germany	4	5.1
Sweden	5	6.3
Scotland	2	2.5
Ireland	1	1.3
Norway	7	8.9
Austria	2	2.5
Holland	1	1.3
Denmark	1	1.3
Ukraine	2	2.5
Totals	79	100.0

TABLE XVIII
 FREQUENCY OF PATENT RESULTS FOR HOMESTEADERS
 WITH DIFFERENT BIRTHPLACES
 (Using 79 quarter sections)

Birthplace	Absolute Frequency of Success	Frequency of Success as Percent of Sample Used	Absolute Frequency of Failures	Frequency of Failures as Percent of Sample Used
England	22	27.8	1	1.3
Canada	6	7.6	0	0.0
United States	25	31.6	0	0.0
Germany	4	5.1	0	0.0
Sweden	5	6.3	0	0.0
Scotland	2	2.5	0	0.0
Ireland	1	1.3	0	0.0
Norway	6	7.6	1	1.3
Ukraine	2	2.5	0	0.0
Austria	2	2.5	0	0.0
Holland	1	1.3	0	0.0
Denmark	1	1.3	0	0.0
Totals	77	97.4	2	2.6

The overwhelming dominance of homestead claimants seemed to have had the United States and England as their place of birth. Of those birthplaces represented in the random sample, their success or failure to patent land could possibly have been an indication of their success or failure in adapting to environmental conditions and farming methods that were required for an agricultural venture on the semi-arid plains.

The figures on Table XVIII represent the most recent success or failure that was listed for each quarter section homestead file. However, ultimate patent success may have stemmed from previous homestead attempts, where different farming methods were used, and where the homesteader had to respond in an imaginative and determined manner to serve economic and climatic conditions. The following table of previous homestead attempts in each birthplace category shows the adaptability and persistence of some groups, and perhaps the result of inadequate knowledge about farming methods, financial management, or the physical environment that characterized others.

TABLE XIX

ABSOLUTE FREQUENCIES OF PREVIOUS UNSUCCESSFUL
HOMESTEAD ATTEMPTS BY EACH BIRTHPLACE
REPRESENTED IN THE SAMPLE USED
(79 quarter sections)*

Birthplace	No Previous Attempts	One Previous Attempts	Two Previous Attempts	Three Previous Attempts	Totals
England	17	5	1	0	23
Canada	5	0	0	1	6
United States	18	5	2	0	25
Germany	4	0	0	0	4
Sweden	3	2	0	0	5
Scotland	2	0	0	0	2
Ireland	1	0	0	0	1
Norway	4	2	0	1	7
Ukraine	1	0	1	0	2
Austria	2	0	0	0	2
Holland	1	0	0	0	1
Denmark	1	0	0	0	1
Totals	59	14	4	2	79

*Note: The opportunity for land speculation was very limited among homesteaders who attempted patents in several different

EFFECTS OF THE HOMESTEADER'S FAMILY SIZE

The size of the family could, quite possibly, have a bearing on the success or failure of a homesteader to patent his homestead entry. A larger family with several children old enough to work, would provide more available help in running the farm, thus helping to attain better success. On the other hand, a larger family also meant that more food and clothing must be made available, and that a larger house would have to be built at the time the homesteader moved onto his land. A large initial cash expenditure would then be required during the first year or two of the homestead operation. Thus, chances for a homesteader with a larger family to achieve patent success, may have, in some cases, been substantially reduced. Of the homesteads that were successfully patented, we can see from Table XX that the majority fell with families of six members or less.

areas. If a homesteader did not patent a block of land, he did not own it, and therefore, lost what he put in it if he left. Thus, he was not a real estate speculator, or a 'professional pioneer.'

TABLE XX
FREQUENCIES OF PATENT SUCCESSES IN PERCENT
FOR DIFFERENT FAMILY SIZES
(Using 74 quarter sections)

Family Size	Frequency of Patent Successes In Percent of Sample Used	Frequency of Failures to Patent In Percent
Single person	28.3	1.4
Man and wife	12.2	0.0
Man, wife and 1 child	10.8	0.0
Man, wife and 2 children	9.5	0.0
Man, wife and 3 children	10.8	0.0
Man, wife and 4 children	13.5	0.0
Man, wife and more than 4 children	13.7	0.0
Total	98.6	1.4

Table XX indicates that the largest portion of homestead successes (28.3 percent) were those of bachelors with no dependents living with them. The reasons for this are twofold.

1. The absolute frequency of successful homestead patents in the bachelor category was

the largest of any of the categories. Of a total sample used for this cross-tabulation of 74 quarter sections, single homesteaders successfully patented 21 of them, or 28.3 percent.

2. Finances, which in a homestead family, would be used for food, clothing and a suitable house, could, in the case of a bachelor homesteader, be spent on securing homestead improvements such as farming implements and wells.

Table XXI used the data from 15 randomly selected quarter sections, out of the original 73 successfully patented homestead titles containing family size information. The results of the findings suggest that single homesteaders required less finances than did a larger family unit, to fulfill the homestead obligations. A further observation reveals the house size of the bachelor homesteader was considerably smaller than that built for two or more persons. Of interest, though of no statistical value, is the fact that only one house out of the random population chosen, was constructed of sods.

Of definite benefit to the bachelor homesteader was his independence, which would allow more frequent trips to the 'tank towns,' to seek relief from the isolation of his homestead during the winter months, to obtain supplies and sell his produce, and most important, to seek winter employment to supplement dwindling financial resources.

TABLE XXI

FINANCES ALLOTTED TO HOUSE CONSTRUCTION AND
OTHER IMPROVEMENTS FOR HOMESTEAD
FAMILY UNITS OF DIFFERENT SIZES
(Using 15 quarter sections)
(House size included in brackets)

Size of Family Unit	Cost of House Construction		Value of Other Improvements*
1 member	\$ 150.00	(14'x14')	\$ 825.00
1 member	125.00	(12'x12')	145.00
1 member	100.00	(10'x14')	80.00
1 member	125.00	(16'x26'sod)	225.00
1 member	75.00	(12'x14')	60.00
1 member	60.00	(10'x10')	200.00
1 member	75.00	(10'x12')	150.00
1 member	45.00	(10'x10')	207.00
2 members	N.A.		175.00**
4 members	1,300.00	(24'x34')	1,100.00
5 members	2,500.00	(28'x42')	685.00
5 members	1,800.00	(26'x28')	1,275.00
6 members	1,200.00	(24'x36')	1,495.00
8 members	350.00	(14'x32')	265.00
14 members	650.00	(16'x36')	405.00
Total Number of Units = 15	Average cost of House Construction = \$577.00		

*Note: Improvements include all other expenses involved in outbuildings, fences, wells and farm equipment.

**Note: \$175.00 for improvements in this case includes the house construction cost, which was unknown.

The position of the homesteader with a family was not entirely a disadvantageous one, though, because one might say, to balance the independence of the bachelor homesteader, the family man had his family who could contribute in establishing a mixed farming economy. Many of the livestock chores, for instance, could be relegated to the wife and children. Of interest in Table XXI are two further points. The first is the great difference between bachelors and family men in the amount of money invested in the farm home and equipment (except the two large families at the bottom of the Table). Secondly, the point above implies that either the homesteaders with families had larger sums of money available for setting up a farm, or more likely, they went further into debt than did bachelors, in order to become established.

To determine whether particular ethnic groups could be characterized by family size, a cross tabulation was carried out, hopefully to reveal a positive relationship. The results of this work are seen in Table XXII.

The findings from Table XXII reveal homesteads occupied by English-born immigrants contained not only the greatest number of bachelors, but also, the largest family unit (homesteader and five other adults and two children). Those born in the United States comprised an equally large proportion of the sample, and, in

TABLE XXII

ABSOLUTE FREQUENCIES OF FAMILY SIZES IN EACH
PLACE OF BIRTH CATEGORY(Children are those under 12 years of age
but can still be included as contributing to
the homestead success)

Family Size	Birthplace Categories *										
	1	2	3	4	5	6	7	8	9	10	11
Bachelor	8	2	5	1	3	0	0	2	0	0	0
2 members	1	2	5	0	1	0	0	0	0	1	1
3 members	2	0	4	1	0	0	1	0	0	0	0
4 members	5	0	2	1	0	0	0	0	0	0	0
5 members	1	1	1	1	0	1	0	1	0	0	0
6 members	2	2	3	0	1	0	0	1	1	0	0
7 members	1	0	1	0	0	0	0	0	0	0	0
8 members	1	0	0	0	0	1	0	0	0	0	0
9 members	1	0	0	0	0	0	0	0	0	0	0
10 members	0	0	1	0	0	0	0	0	0	0	0
more than 10 members	1	0	1	0	0	0	0	0	0	0	0
Totals	23	7	23	4	5	2	1	4	1	1	1

fact, had more homesteads occupied by two or more individuals. With homesteaders of English and American birthplaces having extremely high rates of patenting success (95.7 percent and 100.0 percent respectively), one could assume that the size of the family unit had little effect on patent success (keeping in mind that only 34.8 percent of English-born homesteaders were bachelors and only 21.7 percent of American-born homesteaders were bachelors - from Table XXII). Most other birthplace categories were composed of families in the two to six member range, so considerable importance could be placed on the contributions of the wife and children of the homesteader in the ultimate success of the patent.

EFFECTS OF PLACE OF ORIGIN

Place of origin, or the last place of residence, was used to determine whether homesteaders who emigrated to the study area, could fall back on any previous farming experiences to help establish a successful farming operation. Many of the homesteaders, as we

*Key to Birthplace Categories:

1	England	6	Scotland
2	Canada	7	Ireland
3	United States	8	Norway
4	Germany	9	Ukraine
5	Sweden	10	Holland
	11		Denmark

have already discussed, were born in countries whose climatic and cultural characteristics varied greatly from those of southern Alberta, but they were still able to successfully patent their homestead entry. This was possible because numerous migrants from western Europe, and the forested areas of the eastern United States had, previous to emigration to southern Alberta, gained valuable 'dry-land' farming experience on the plains of the Dakotas and the American west. An example of this would be the migrations of the Mormons, who, in the 1840's were forced through persecution to flee from their settlement of Nauvoo.³ This band of people, led by Brigham Young, migrated to the Great Salt Lake Valley of Utah, and eventually established what was an efficient method of farming, to overcome the dry, arid environmental conditions. This was the use of irrigation. When the Mormons migrated to the Cardston area of Alberta in the 1880's they brought the knowledge of irrigation with them. As a result, these people were among the most successful farmers in southern Alberta, and in the study area in particular. Of 37 homestead applications with American origins, 21 were received from migrants from North Dakota, and 7 had Utah listed as the place of origin. Both groups

³J. Lehr, Mormon Settlements in Southern Alberta, unpublished M. A. Thesis, 1971, p. 13.

of people were able to bring with them valuable farming experience; the North Dakotans, a knowledge of dry-land farming, and the people from Utah, a knowledge of irrigation farming. Of interest is the fact that the Mormons remained in the Lethbridge - Coaldale - Taber districts within the study area. The Mormons are presently located mainly south of the study area, in the Stirling, Raymond, Magrath and Cardston districts.⁴

Of those Homestead Files registering previous failures to immigrants from England, North Dakota and Utah, the absolute and percentage frequencies of previous failures were considerably higher for those homesteaders originating from England.

According to the Homestead Files, the homesteaders with England as their place of origin, concentrated mainly on the growing of coarser grains, such as rye, oats and barley, with some emphasis on the raising of chickens and hogs. Homesteaders from North Dakota concentrated their efforts mainly on the growing of grains, perhaps because of their experience in wheat growing, and their experience of working with draft animals on larger plots of land. These people were also more sensitive and knowledgeable about the constantly fluctuating weather conditions to be found in the

⁴Ibid., p. 8.

study area. Settlers from Utah, although at first growing mainly root vegetables, chickens, hogs and cattle, became excellent grain farmers as they learned from experience to apply irrigation to grain farming. The Mormons from Utah and Idaho were particularly adept at growing sugar beets, which seemed to thrive under the hot summer sun, and controlled applications of water. The first sugar beet factory in the study area was built by the British Columbia Sugar Refining Company of Vancouver and located at Taber (1931). This followed by 28 years the first sugar factory in southern Alberta, which was built at Raymond, in 1903, by Jesse Knight, a wealthy Mormon.⁵

Of the 28 homestead applications received from migrants from Utah and North Dakota, all were successfully patented. The average time to patent for those from North Dakota was four years, and for those from Utah, the average was slightly longer, at five years. In the latter case, the longer time to patent may have been because the first year or two were likely spent in planning and constructing irrigation ditches and canals. Table XXIII indicates that when entry was made on to a homestead by a North Dakotan or Mormon farmer, a reasonable chance for success was imminent.

⁵A. Johnston, The Role of Field Crops in Southern Alberta Agriculture, 1967, p. 8.

TABLE XXIII

FREQUENCIES FOR PREVIOUS HOMESTEAD FAILURES FOR
SETTLERS FROM ENGLAND, NORTH DAKOTA AND UTAH
(Using 48 quarter sections - percentage*figures in brackets)

Place of Origin	No Previous Failures	One Previous Failure	Two Previous Failures	Three Previous Failures
England	14 (70.0)	5 (25.0)	1 (5.0)	0
North Dakota	16 (76.2)	4 (19.0)	1 (4.8)	0
Utah	6 (85.7)	1 (14.3)	0	0
Totals	36 (75.0 average)	10 (20.8 average)	2 (4.2 average)	

*Percentages are the percent of the total failures that are found in each place of origin category.

EFFECTS OF PREVIOUS OCCUPATIONS

TABLE XXIV

ABSOLUTE AND PERCENT FREQUENCIES OF
HOMESTEADERS WITH VARYING
PREVIOUS OCCUPATIONS*
(Using 69 quarter sections)

Previous Occupation	Absolute Frequency	Frequency as Percent of Sample Used
1	45	65.2
2	7	10.2
3	17	24.6
Total	85	100.0

*Key to Previous Occupation Categories

1. Previous occupation - farmer
2. Previous occupation - worked as a mechanic, builder or occupation partially related to a farmer.
3. Previous occupation - work that was not related to farming or which could not be applied to some farming practice, i.e. train conductor.

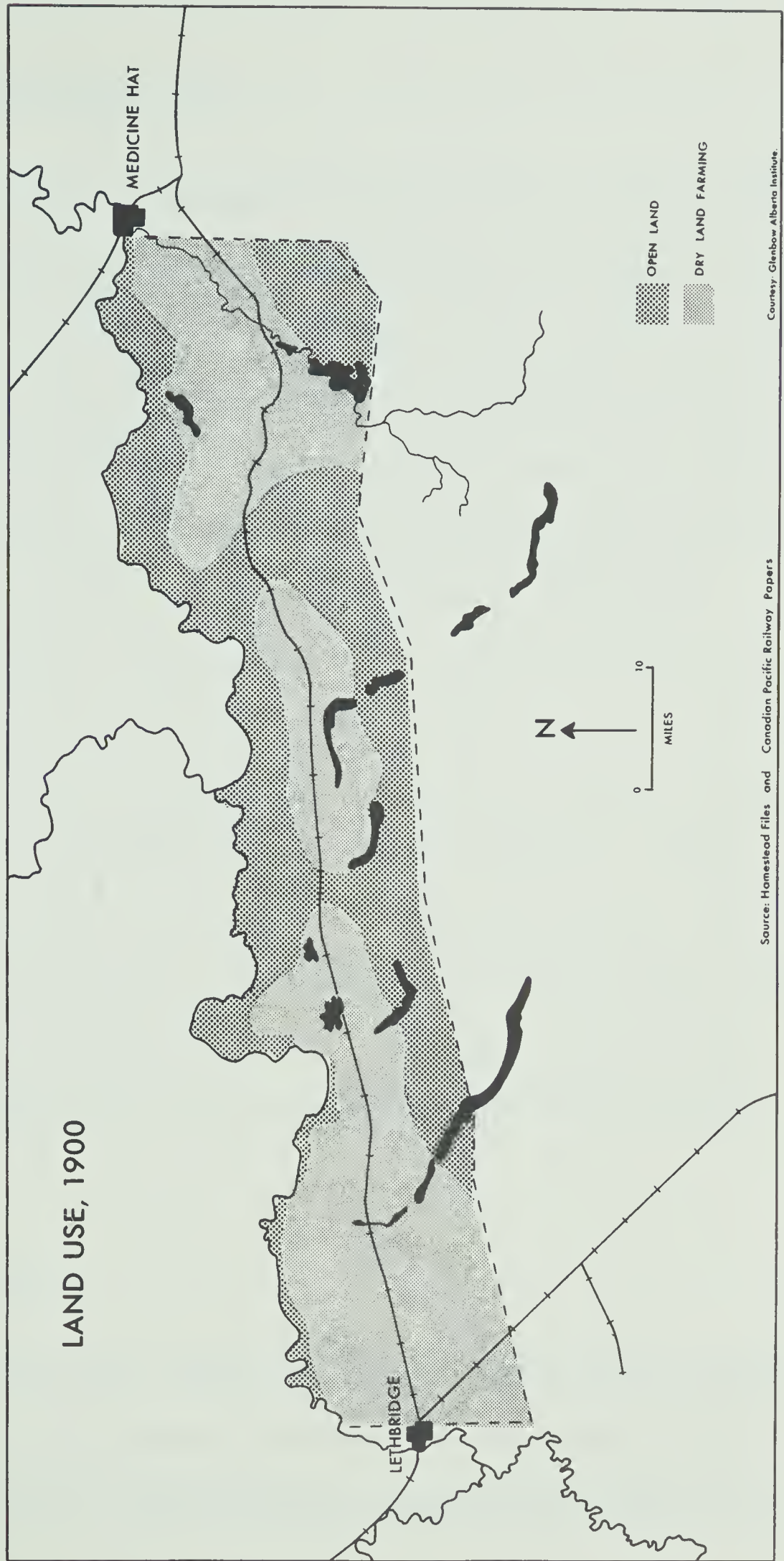
From the data revealed in Table XXIV, the majority (65.2 percent) of those people wishing to establish a homestead in the Lethbridge-Medicine Hat study area had previous farming experience. This experience, particularly those homesteaders from Utah and North Dakota, would definitely have proven beneficial in completing the Homestead obligations in this dry-land farming area.

The western region of the study area, Lethbridge to Fincastle, has continued to produce outstanding sugar beet crops. Throughout southern Alberta, the acreage of sugar beets grown on irrigated lands has increased from five thousand in 1925, to forty-three thousand in 1968.⁶

EFFECTS OF CANADIAN PARTICIPATION IN MILITARY CONFLICTS

During the period of Canada's growth from a minor agricultural producer (pre-1885), to that of a burgeoning industrial nation (post World War II), she was involved in two major World Wars, and the Boer War of 1899.

⁶Department of Agriculture Publication No. 1400, Growing Irrigated Crops on the Canadian Prairies.



LAND USE, 1900

MEDICINE HAT

LETHBRIDGE

OPEN LAND
DRY LAND FARMING

N
0 10
MILES

Source: Homestead Files and Canadian Pacific Railway Papers
Coursely: Glenbow Alberta Institute

MAP 4.1

BOER WAR (1899 - 1901)

Canada's involvement in the Boer War was rather minor in comparison to World War I and World War II, in that her contributions, both financially and in men and arms, were in the form of voluntary service. Small numbers of Canadians from across the country volunteered to serve with the British army in its conflicts against the Dutch South Africans. The Canadians who did serve were from a variety of walks of life, including businessmen, factory workers, and farmers. At the end of the conflict, in 1901, many of these individuals returned to resume their past occupations, but some decided to apply for homesteads on the prairies through the government assisted Soldier Settlement Schemes. Although some sources that were used hinted that quarter sections within the study area were set aside for, and occupied by veterans of the Boer War, the Homestead Files, as the primary source of data, gave no definite indication of Soldier Settlement scheme quarter sections.

WORLD WAR I

World War I affected the Canadian agricultural economy in much the same manner as the Boer War had, except that the conflict of 1914 - 1918 demanded an extremely high proportion of

Canadian participation in supplies, weapons, and manpower. In Canada's rural, and agricultural west, production on many farms came to a complete halt, as farmers and their sons (of sufficient age to be conscripted), left the farms to fight in Europe, or to work in the arms and munitions factories of eastern Canada. Quite often, as a result, the farming chores were left to women and children, and to casual part-time labor of high school and college age boys. For this reason, some farms were abandoned during the war years, and production did not begin again until the return of the veterans in 1918.

In the Lethbridge-Medicine Hat study area, the war years were perhaps not as depressing as those in other agricultural areas. Irrigation projects were expanding at a tremendous rate, and many acres of previously dry range land were being brought under the plow. 1915 and 1916 saw extremely good crops,⁷ and production of sugar beets, vegetable crops and grains was at an all time high. However, the economic boom and the return of many war veterans to their land did not provide a boon to farm production, because 1917 and 1918 saw the arrival of hot, searing winds and extremely low rainfall, that for many years following caused almost complete

⁷F. W. Gershaw, "The Short Grass Area", 1956, p. 100.

crop failures. "Even the ranchers suffered as it took from 30 to 40 acres to feed one animal and often the water supply dried up."⁸ These conditions heralded the first mass exodus of farmers and ranchers from the study area to the better watered woodlands of central and northern Alberta. The result of this exodus was the presence of many abandoned farms, which lay dormant and useless. In order that tax losses could be recovered, the Federal and Provincial Governments devised a system of reclaiming many of the abandoned farms, and leasing the land under grazing permits to ranchers in the area. These conditions seemed to be an ominous warning of what was to come.

THE 'DEPRESSION' AND 'DUST BOWL' - THE DEPRESSION

The agricultural drought and depression in Canada began in 1929, and grew progressively worse until the complete disaster on the Canadian prairies in 1937. During the years from 1931 to 1938, soil drifting was characteristic of southern prairies, particularly the areas within the Palliser's Triangle, and in southern Alberta, the damage was so serious and widespread, that farming was impossible without action taken towards permanent control of

⁸Ibid., p. 101.

the drifting topsoil. In the Taber-Medicine Hat region of the study area, where grass cover was shorter and thinner, and where more open wheat and grazing lands existed, the prices - debts - interest - depression was at its greatest.⁹ Prices received for agricultural produce were so slow, that farmers were forced into debt. Many applied for and received relief from the provincial government, thus incurring debts that continued to collect interest, until the farmers had no alternative but to abandon their farms. This spurred farmers throughout the Province to overthrow the U.F.A. (United Farmers) government, and vote in W. Aberhart's Social Credit revolution of 1935. The United States was, at this time, hit by widespread drought and national depression as well, and in 1931, closed its borders to Canadian beef cattle. Prices for prime Alberta beef dropped in the Calgary markets from \$7.00 per 100 to \$2.00.¹⁰ For the study area, heavily committed to production of beef cattle and pasturing, this embargo was a serious blow.

Wheat yields, particularly in the dry-land portion of the eastern part of the study area fell drastically, as the lack of precipitation and hot dry winds, caused early crop maturity with lack

⁹J. H. Gray, The Winter Years, 1966, p. 85.

¹⁰Loc. cit.

of good 'heading out' of the grain stalks. Many farmers, out of desperation, were forced to sell or abandon their farms.

TABLE XXV

WHEAT YIELDS IN LETHBRIDGE (1) AND MEDICINE
HAT (2) CROP DISTRICTS FOR 1929-1938

Year	Crop District	
	1	2
1929	22.3 bu.	11.0 bu.
1930	22.7 bu.	11.2 bu.
1931	14.1 bu.	10.0 bu.
1932	18.9 bu.	16.0 bu.
1933	9.7 bu.	7.3 bu.
1934	20.6 bu.	9.2 bu.
1935	14.0 bu.	11.4 bu.
1936	6.8 bu.	8.2 bu.
1937	18.1 bu.	9.0 bu.
1938	28.0 bu.	15.7 bu.

Source: Hopkins, Palmer, Chipil, Soil Drifting Control in the Prairie Provinces, p. 55

Poorer grades of beef and grain from southern Alberta barely returned enough to pay for freight rates, and the whole farming scene became one of despair, boredom and frustration, Gray, in The Winter Years, gives two examples of the state of the mental attitude that existed among farmers in southern Alberta. "For the

farm population, keeping the radio operating became a major pre-occupation and crowning frustration."¹¹ "Faced with a choice of missing 'Fibber McGee and Molly' or making a ten mile round trip to town in thirty below weather, there was no question that the choice would fall on making the trip."¹²

In rural southern Alberta, motor transportation became completely immobilized during the intensely cold winters. Most trucks, used to haul grain to 'tank towns' such as Bow Island and Taber and return with supplies, were crank equipped but these were useless as motors froze. "...and many a desperate farmer, seeking to heat his truck engine with a blowtorch succeeded only in setting it afire."¹³ The 'Bennett buggy,' a car without its engine, and pulled by a team of horses, became a common sight on the roads of southern Alberta.

Conditions by 1936 were so desperate in parts of the study area where there was no irrigated land, that most cattlemen and farmers would have left their farms, except that they had no money with which to go elsewhere. Consequently, many remained on their farms, and the buildings and land deteriorated rapidly, due to inactivity. In 1933 alone, the drought drove more than 55 farm families

¹¹Loc. cit.

¹²Loc. cit.

¹³Ibid., p. 107.



out of southeastern Alberta, (mainly the Grassy Lake to Medicine Hat area), to the bush country north and west of Red Deer.¹⁴ The Social Credit Government (1936) was striving to get the Federal Government to help move four hundred thousand head of starving cattle out of southern Alberta to available pastures in the north.¹⁵ Those farms within the study area that relied on dry-land farming were devastated by the fall in prices during the 1930 - 1936 period. Following is a graph showing the price per bushel of wheat received of farmers, from a peak year in 1929 through to a gain in price witnessed in 1937.

EFFECTS OF THE DUST BOWL

Although the drought conditions that existed throughout the Depression years could be blamed on nature, the 'Dust Bowl' that occurred in southern Alberta was almost entirely man made.¹⁶ Quite generally, many thousands of acres of the study area, mainly the sandy, clay soils, were broken to the plow, and never should have been. These were suited for grazing lands, and should have

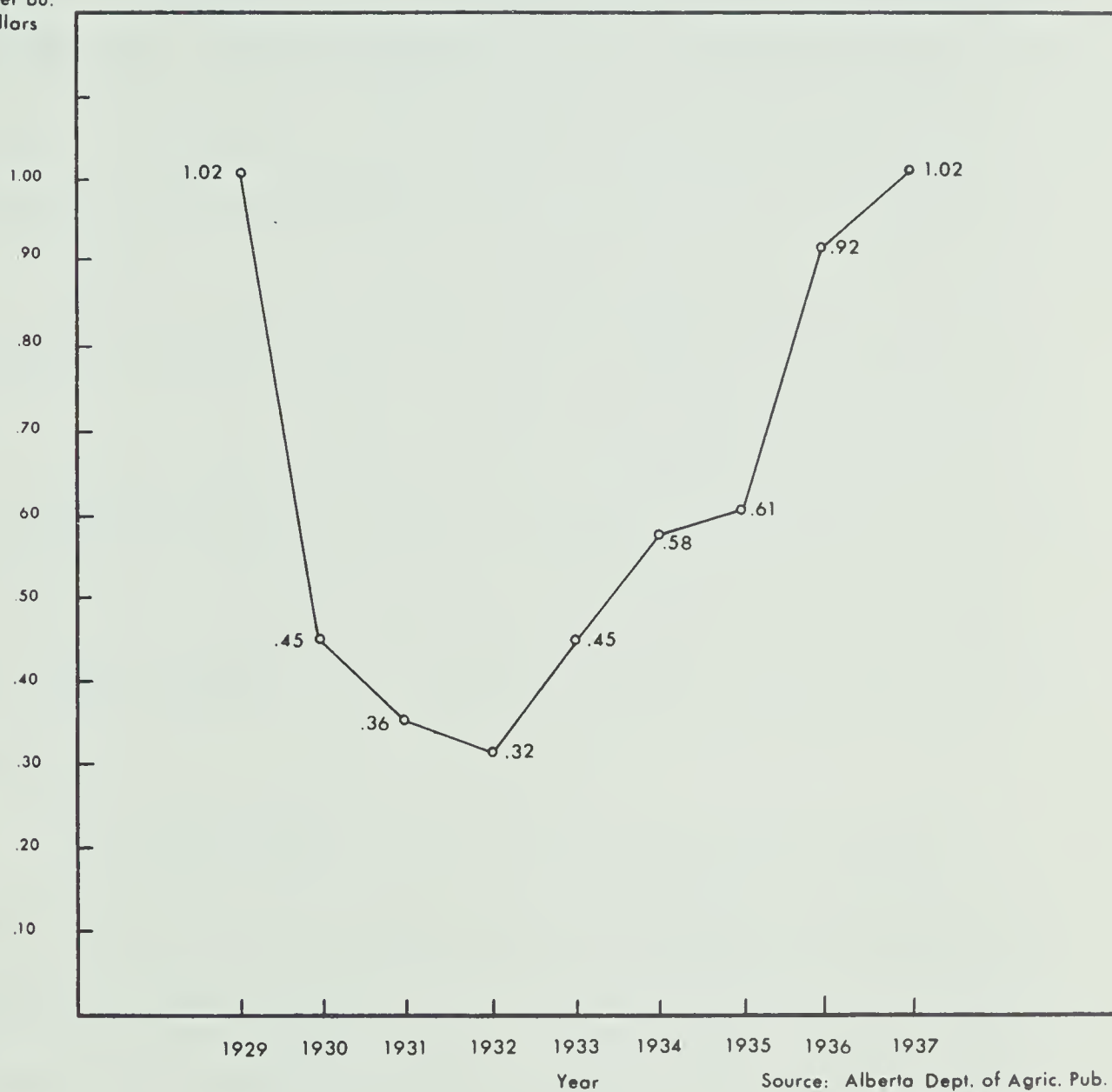
¹⁴Ibid., p. 109.

¹⁵Ibid., p. 111.

¹⁶E. S. Hopkins, A. E. Palmer, W. S. Chepil, Soil Drifting Control on the Prairie Provinces, 1946, p. 6.

FIGURE 4.2

Price Per Bushel Of Wheat, 1929-1937.

Price per bu.
in dollars

Source: Alberta Dept. of Agric. Pub.
A HISTORICAL SERIES OF
AGRICULTURAL STATISTICS
FOR ALBERTA, p. 2.

been left in that state. The actual topsoil blizzards that affected so much of the study area, began in the winter of 1931, due to a complete lack of snow on the ground. Strong chinook winds blew the topsoil in virtual blizzards of dirt, and created a constant grey pall in the air. The hot, dry summer of 1931 that followed, caused a complete crop failure, with the exception of irrigated lands, particularly in the Lethbridge to Bow Island district. This dry, windy condition seemed to set the trend for the next five years, because from 1932 to 1936, the winters grew steadily colder and drier, and the summers grew hotter.¹⁷ During that time, countless numbers of families were virtually 'blown' off the land. The extremely dry conditions made crop growing and cattle ranching all but impossible because the moisture deficit that existed in the average years was greatly increased.

The Lethbridge-Medicine Hat study area was almost ideally suited for the development of soil drifting. A combination of physical conditions and improper farming methods led to the occurrence of the widespread dust blizzards. The soil throughout the study area was generally rather sandy, with a fairly high proportion of calcareous clays. These were more susceptible to soil

¹⁷J. H. Gray, The Winter Years, 1966, p. 106.

TABLE XXVI

EVAPORATION FROM A FREE WATER SURFACE
(At the Lethbridge Experimental Farm)

Precipitation			Evaporation	
No. of Years	Total Annual	5 Months (May to Sept.)	No. of Years	5 Months (May to Sept.)
41	15.76"	10.13"	24	26.33"

Therefore, average moisture deficit for May-September period is 16.20"

Source: Hopkins, Palmer, Chepil, Soil Drifting Control in the Prairie Provinces, Department of Agriculture, 1946, p. 57.

drifting than are soils classified collectively as loams, and a noticeable lack of wooded or park areas left little protection against the constant winds that punished southern Alberta. The above average annual moisture deficit that existed throughout the study area during 1931 - 1936, combined with the strong winds and flat, treeless nature of the land tended to exaggerate the improper use of summer fallowing. In order to increase production within the dry-land wheat regions of the study area (mainly Taber-Medicine Hat), large fields were summer fallowed and cultivated so intensely that the fibrous material of the original prairie grasses was



Photo 6: Improper Cultivation Methods Leading to the 'Dust Bowl,' 1913.
G. Ernest Brown Collection, Provincial Archives of Alberta.

destroyed and quickly decomposed, causing the loss of a soddy condition in the soil.¹⁸ As the conditions worsened each year, the lack of precipitation and high winds began to dislodge soil particles, thus leading to extensive soil drifting. In many cases, agronomists have found the damage from soil drifting to be permanent.¹⁹

Although the immediate effects of the 'Dust Bowl' years were devastating for a great number of farmers, the long range effects have been offset by the use of various control measures which are still commonly practiced in the study area.

1. Strip Farming - a method of soil drifting control, developed by farmers near Lethbridge, which does not appreciably alter cropping practices; in which strips of land of regular widths (usually 10 - 20 rods) are arranged alternately in a north-south direction (approximately at right angles to the prevailing west winds of southern Alberta.)²⁰ Alternate strips are seeded to grain, while every other strip is left in fallow. This method of cropping can be carried out in a two or three year program. It has drastically changed farming methods in that it has made dry-land farming very reliable and profitable. Practically all of the grain farmed in the study area is done so under the strip farming method. A quarter section could accommodate 10 strips of 16 rods each in width.

¹⁸Pers. comm. G. H. Hall, Fincastle District, 1970.

¹⁹Hopkins, Palmer, Chepil, Soil Drifting Control in the Prairie Provinces, 1946, p. 8.

²⁰Ibid., p. 14.



Photo 7: Strip Farming, Bow Island Area, 1970.
Source: Field work.



Photo 8: Strip Farming North of Lethbridge, 1970.
Source: Field work.



Photo 9: Trash Cover Farming, 1939. Ernest Brown Collection, Alberta Provincial Archives.

2. Trash cover Farming - a method of cultivation commonly used whereby grain stubble is not turned under by plowing, but is left to lie close to, or on the surface of the soil. The increase in fibrous material, therefore, acts as a stabilizer to help prevent drifting. Trash cover is usually practiced in conjunction with other soil drifting control measures, such as strip farming.
3. Methods of creating ridge or cloddy soil surfaces is used to prevent the mass removal of soils. Every fourth or fifth shank of a cultivator is equipped with a ridging shovel, to make furrows about three to four feet apart. With greater surface roughness the velocity of the wind at the land-air interface is reduced.
4. Seeding down soils permanently to grass was first practiced in the thinner grass areas near Bow Island.²¹
5. Grass in rotation with crops.
6. Shelter belts - The use of shelter belts has greatly changed the landscape in a region like the study area, where no indigenous tree cover existed. It was found during the latter stages of the 'Dust Bowl' period that row planting of tree, and quite often, caragana hedges, on the windward sides of fields, greatly reduced the effects of wind erosion. Presently, nearly every farm within the study area has rows of trees planted along the western edge of fields.
7. Cover crops - such as oats or barley are seeded in August to provide soil protection through the late fall, the winter and early

²¹Pers. comm. F. O. Oleson, Bow Island District, 1970.



Photo 10: Shelter Belt, Fincastle Area, 1919. Ernest Brown Collection,
Alberta Provincial Archives.



Photo 11: Poplar Shelter Belt, Taber Area, 1970.
Source: Field work.



Photo 12: Caragana Shelter Belt, Coaldale Area,
1970. Source: Field work.

spring.²² This practice was first used in the Coaldale - Cranford - Barnwell region of the study area.²³

CONCLUSIONS

The various cultural phenomena that have been discussed in this chapter have all had marked effects on settlement and the changes in land use and agriculture throughout the Lethbridge-Medicine Hat study area. From the time of the first ranching ventures, until the present day, a change from an open range cattle area to an intensely cropped and diversified area has occurred. The American ranchers who first entered the area in the 1880's gave way, following the railway in 1885, to homesteaders who worked their land successfully in most cases, and who developed a subsistent mixed farm economy. The conditions to agriculture that were made by the various groups from Europe and the United States were useful in establishing a viable agricultural base. The Europeans with their knowledge of manuring and animal husbandry, and the Americans, with their experience in dry-land and irrigation farming, helped transform the open prairie of the study area to a diversified agricultural region. The industrial and

²²Ibid., p. 22.

²³Loc. cit.

economic booms that occurred briefly following World War I caused an increase in farm mechanization and efficiency, and this trend has continued, with a brief respite during World War II.

Alex Johnston of the Lethbridge Experimental Station commenting on the change from horses to tractors states:

In the late 1920's and early 1930's, when North American agriculture went from animal power to fossil fuel, the source of energy was shifted from grains and pasture to fossil fuels, thus releasing millions of acres for the production of additional grain products. This, combined with mechanical horsepower and advanced technology in plant breeding, has produced in North America surpluses such as the world has never known. Agriculture is so production oriented that little attention has been given to alleviate these surpluses through efficient marketing and local utilization of farm products.²⁴

Innovation such as shelter belts, strip farming, and trash cover farming have all proved to be outstanding contributions to the agricultural scene, even though they arose at a time of depression and misery. The very fact that farming in the study area was able to survive, and improve despite the horrors of the 'Depression' and 'Dust Bowl' era, are ample evidence of the fortitude and enterprising nature of farmers in that region.

As one reviews the progression of agricultural activities, and changes in farming methods and land use, it becomes quite

²⁴Pers. comm. A. Johnston, Lethbridge.

evident that the development of agriculture, as it is in the study area today, has been due to drought and faulty land practices, because of man's earlier and quite varied perception of the area. The result of this has been a greater uniformity within the study area of farming techniques and increased farm production.

ADDENDUM

The Years Following 1939. Although of less direct relevance to the period of change for this study, for the sake of completeness of the total picture, some of the post World War II changes need to be kept in mind.

World War II brought about three major changes to agriculture in Canada. They were large scale mechanization on farms, consolidation of small farms into cooperative and commercial ventures, often with absentee ownership, and the trend from rural to urban living, with the consequent diminishing of numbers of small farms. Statistics attesting to this were available for Alberta, but the irregular shape of the study area prevented the researcher from limiting any statistics to the particular boundaries of that area.

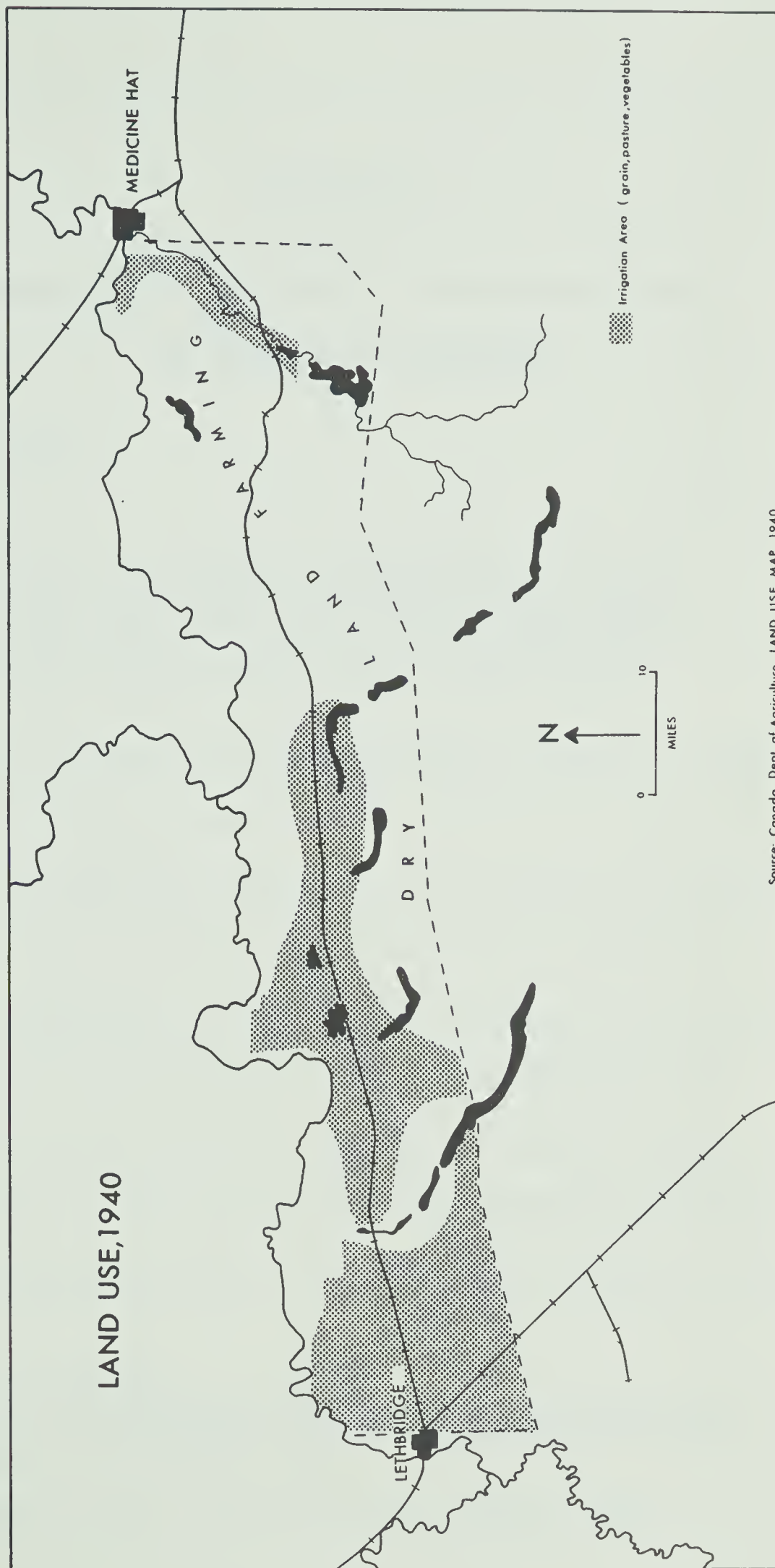
TABLE XXVII

POPULATION, FARMS, OCCUPIED LANDS, TENANCY AND LAND USE FOR ALBERTA

	1921	1931	1941	1951	1961	1965
Total Population	588,454	731,605	796,169	939,501	1,331,944	1,463,203
Farm Population	-----	375,097	383,964	345,222	287,814	281,583
Living on Farms (%)	-----	51.3	48.2	36.7	21.6	19.2
Number of Farms	74,000	86,917	93,200	84,315	73,212	69,411
Farms with Sugar Beets	-----	-----	-----	1,347	1,257	971

Source: Alberta Department of Agriculture, A Historical Series of Agricultural Statistics for Alberta, 1966, p. 134.

Rising prices for agricultural produce brought several changes to the study area; notably, the expansion of irrigation to provide a reliable water supply to previously uncultivated areas. Higher profits allowed farmers to invest in more modern irrigation facilities resulting in the spread of irrigation, particularly in a northeasterly direction from Taber and Bow Island. Second in importance was the relocation of large numbers of Japanese people from the west coast of British Columbia during the war, to the study area (particularly the Lethbridge region). Since then, many Japanese people have moved to the Vauxhall, Alberta area, to concentrate on large scale potato farming. The Japanese population, steeped in a heritage of market gardening, experimented with field vegetable crops, mainly peas, beans, potatoes and corn, and successfully combined methods of fertilizing and irrigating to produce outstanding crops. In the western part of the study area, Lethbridge - Coaldale - Taber, market gardening has become extremely important in diversifying the economy of the area. Many fields of potatoes, peas, and beans, can be seen, along with crops of onions, cabbage and lettuce.



Source: Canada Dept. of Agriculture LAND USE MAP, 1940
MAP 4.3

CHAPTER V

EFFECTS ON LAND USE OF THE DEVELOPMENT OF IRRIGATION SCHEMES

INTRODUCTION

If settlement tended to rob southern Alberta of its picturesque and profitable ranching industry, it gave back what it took in the form of irrigated agricultural lands, which knew no crop failures. Economically, the gain per acre was much greater than the loss.¹

This statement serves to exemplify the degree of importance that irrigation has had on the development of the semi-arid lands of the study area. Without doubt, the greatest advantages that have been derived from irrigation are the increased diversity of crop production; the reliability of cropping in a moisture deficient area; and thirdly, the increase in profitability of the small farm, acre for acre, as compared the larger, dry-land farms common in the days before the trend to large scale irrigation.² During the period of time when cattle ranching and large

¹A. S. Morton and C. Martin, Canadian Frontiers of Settlement, vol. 2, 1938, p. 115.

²Pers. comm. J. F. R. Moore, Taber, 1970.

scale dry-land wheat farming dominated in the study area, a section of land (640 acres) was looked on as being too small, and operating farms several thousand of acres in size was considered to be the only profitable way of farming.

In present days, farm sizes in the study area have generally decreased, contrary to the provincial trend, due to the high production value per acre of irrigated land. In the Taber Irrigation District, which is the most prosperous district in the study area, the size of most farms range from 80 to 240 acres, indicating substantially smaller than average size of farms.³ Mr. Alex Johnston, of the Lethbridge Experimental Station, has stated that estimates of land around Taber, if used for irrigated crops, returns about \$119.00 per acre, and if left for dry-land cropping, returns about \$9.00 per acre.⁴ In areas where rainfall is more adequate (Mr. Johnston indicated the Leavitt, Alberta area), the difference in value per acre between dry land and irrigated land is considerably less (\$24.00 per acre of dry land, to \$34.00 per irrigated acre).⁵

For the success of any irrigated project, the suitability of the topography is a major determinant. The Lethbridge -

³C. J. McAndrews, Alberta Dept. of Agriculture pub., The Effects of Irrigation on a Region, p. 10.

⁴Pers. comm. Mr. A. Johnston, Lethbridge, October, 1970.

⁵Pers. comm. Mr. A. Johnston, Lethbridge, October, 1970.

Coaldale - Taber region is well suited in this way to irrigation because it comprised the lake beds of glacial lakes Taber and Lethbridge, formed by melt-water at the retreat of the last period of continental glaciation. The ice moved southward, through the study area, and had halted at the Rocky Mountains in the west. An east-west trending ridge of land, running approximately from the Porcupine Hills to the Cypress Hills, forms the division between the South Saskatchewan and Missouri River drainage basins, and the southern limit of continental glaciation. Thus, a 'bowl' or depression was formed, covering the entire study area, and forming the lake bed of the glacial lakes.⁶ The Chin Coulee, running east-west some 8 to 12 miles south of the Oldman River in the western portion of the study area, and the Seven Persons Coulee, southwest of Medicine Hat, are southeast trending coulees that served as drainage spillways for the glacial lakes that drained southward to the Missouri basin.

The first notable irrigation projects in southern Alberta were constructed in the Cardston area by Mormon homesteaders during the 1870's and 1880's. The first actual irrigation project was John Glen's Fish Creek scheme, near Midnapore, and this

⁶Pers. comm. Dr. A. E. Palmer, Lethbridge, October, 1970.

provided the incentive to start numerous other projects in the district.⁷ By 1895, a total of 79,000 acres was irrigated on 112 small projects in the Cardston-Magrath areas.⁸

Without irrigation, the study area would have consisted of large, low production per acre dry-land wheat farms, and range land carrying about one cow to 40 or more acres.⁹ Through the study area today, the dry-land farming area has about three persons or less per square mile. Less intensively irrigated land has a population of about 11 persons per square mile, while in the heart of the irrigation country, near Taber and Coaldale, rural population density jumps as high as 32 persons per square mile.¹⁰

Irrigation schemes in the study area were inaugurated in 1901 by the Alberta Railway and Irrigation Company, when 600 acres near Lethbridge were irrigated.¹¹ Several small scale projects were in operation in the area by 1919, with the largest

⁷A. Johnston, The Role of Field Crops in Southern Alberta Agriculture, 1967, p. 7.

⁸Loc. cit.

⁹Pers. comm. M. Wilde, Taber, October, 1970.

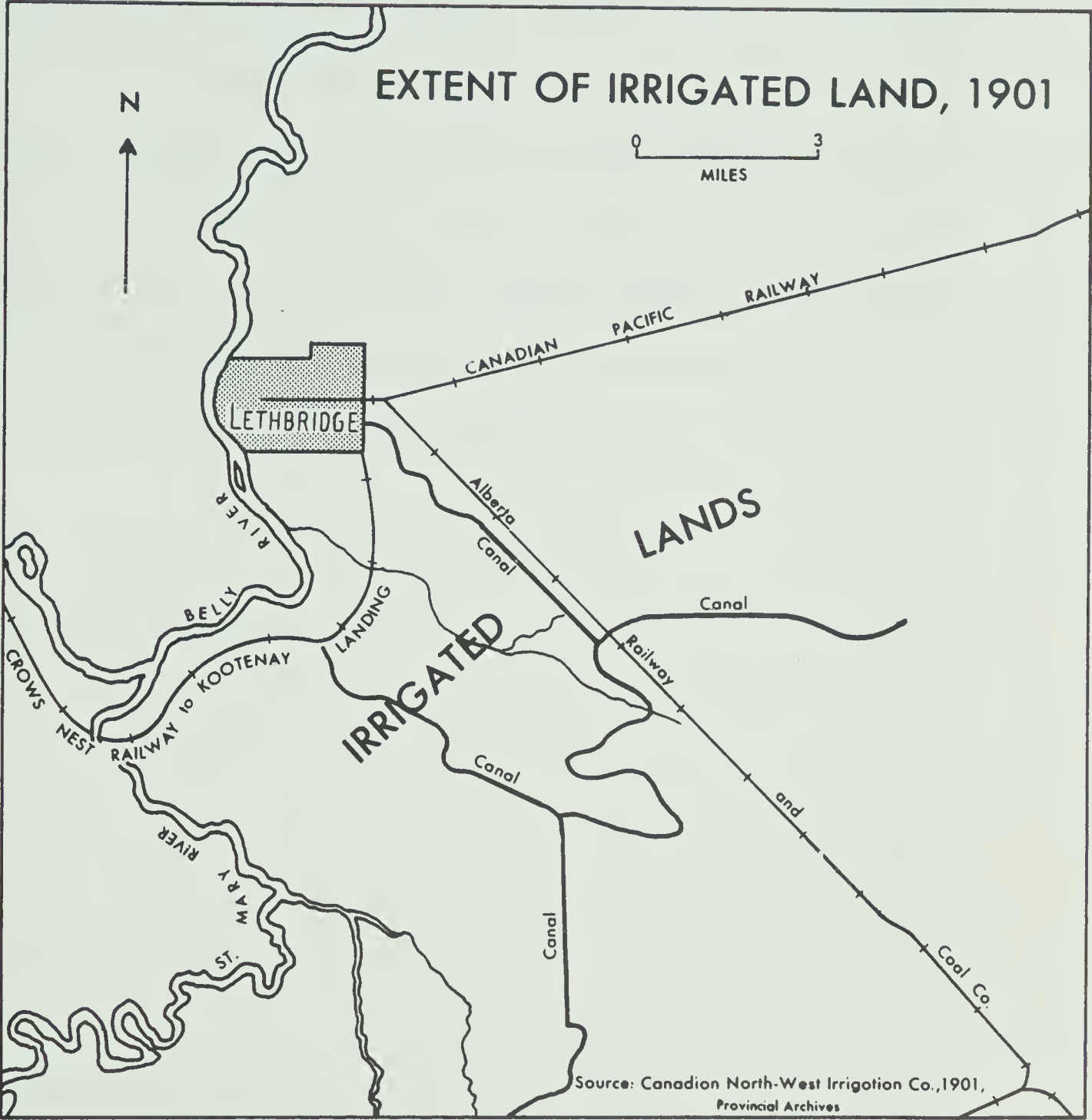
¹⁰C. J. McAndrews, The Effects of Irrigation on a Region, p. 2.

¹¹N. S. Thomson, Water Policy, Administration, and History of Irrigation, 1967, p. 18.

being at Taber, where 17,000 acres were brought under irrigation at one time.¹²

Conditions existing at the turn of the century and up till the post World War II depression in agriculture and industry in 1920, proved ideal for the instigation of irrigation projects in southern Alberta. The world, during this period of time had witnessed a period of rising price levels, and agricultural and industrial expansions. This brought a rise in land values and prosperity. An increase in North America and Europe of the population 'boom' resulted in increasing food demands, and the consequent rise of food prices. The result was an increased demand for food and an upward trend in the value of good agricultural land. The study area had, however, experienced a series of drought years, and soil drifting occurred that resulted in numerous crop failures and farm abandonments. Widespread feeling in this area was that dry-land farming would be subjected to numerous variations in production, because of climatic fluctuations. Irrigated land seemed to be the solution that would give stability to crop production, and provide diversification to what had been primarily a one crop economy of dry-land wheat. A Provincial Reclamation

¹²Loc. cit.



MAP 5.1

Act of 1919,¹⁴ set aside 312,000 acres in the study area, and greatly reduced the acreage of dry-land farming. With the success that became apparent through the use of irrigation, many farmers began to investigate the possibility of connecting their farms to the main irrigation canals. By 1930, several irrigation projects were in operation, serving large tracts of land in the study area. Of 314 parcels of land in the Taber Irrigation District that participated in irrigation practices in 1929, the average of irrigable acres per farm unit was 68.1 acres.¹⁵

¹⁴M. L. Wilson et al., Lethbridge Northern and Other Irrigation Districts in Alberta, Report of Commission on; 1966, p. 8.

¹⁵Report of Commission Appointed in 1936 to Inquire into the Various Phases of Irrigation in Alberta, 1936. p. 28.

TABLE XXVIII
IRRIGATION PROJECTS IN THE STUDY AREA, 1930*

Project	Acreage Served
C. P. R. Lethbridge Section	89,000
Canada Land and Irrigation Co.	67,420
Taber Irrigation District	21,457
Lethbridge Northern District	<u>46,470</u>
Total	224,747

*Wilson, et al., Lethbridge Northern and Other Irrigation Districts in Alberta, 1966, p. 8.

The Canadian Pacific Railway Company, with its interest in land development on the prairies, remained involved with irrigation in the study area until quite recently. The C.P.R. constructed a huge reservoir in the Chin Coulee, and under an agreement negotiated with the provincial government, a sale was made by the railway of 34,000 acre feet of water, to be delivered from this reservoir to the Taber Irrigation District project at 50 cents per acre.¹⁶ In 1929, an additional area of 4,661 acres was added

¹⁶T. Sundal, Report of Commission Appointed in 1936 to Inquire into the Various Phases of Irrigation Development in Alberta, pub. Lethbridge Herald, 1936, p. 28.

to the T. I. D. project, and this as well, was to be watered by the Chin reservoir.¹⁷

IRRIGATION METHODS USED IN THE STUDY AREA

The period of time that this study focuses on (1880 - 1939), excludes much of the land development in the Lethbridge-Medicine Hat area, which was the result of extensive irrigation projects such as the St. Mary and Milk River Project (1946). For this reason, statistics concerning irrigation have been rather sketchy, when dealing with this particular area. The records of irrigation have been kept for such areas as the Taber Irrigation District, but much of this District lies outside of the study area, and delimiting the statistics to include just the study area was virtually impossible, considering the available time element and the sources available. Since the irrigation projects in the study area are rather typical of those throughout southern Alberta, considering varieties of crops, farm size, and irrigation methods. Because of this, it was felt that the effects of irrigation on land use within the study area can be seen by applying general information to this specific area.

¹⁷Loc. cit.

The first irrigation systems in the study area were crudely constructed gravity systems, where small plots of land were flooded and then regularly watered from small hand dug ditches, leading from a main irrigation canal that may have its source in a river, stream or lake. To a great extent, the first irrigation systems were dug by hand, severely limiting the size of plot that could be irrigated. Main irrigation canals were, however, dug by machinery that was usually powered by coal or wood. As larger scale gravity systems were brought into use in the 1930's and 1940's, efficient dams better controlled flooding methods, and larger canals greatly improved irrigation in the study area. Gravity systems are still used rather extensively throughout the

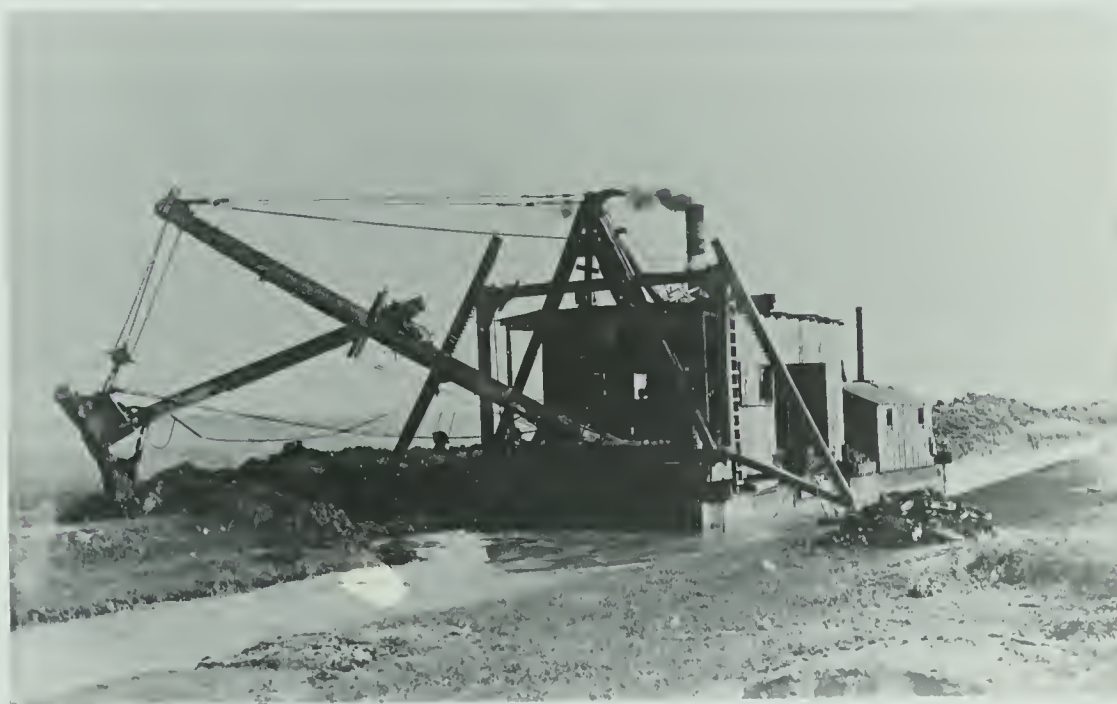


Photo 13 Irrigation Canal Digger, 1901. Glenbow
Alberta Institute.

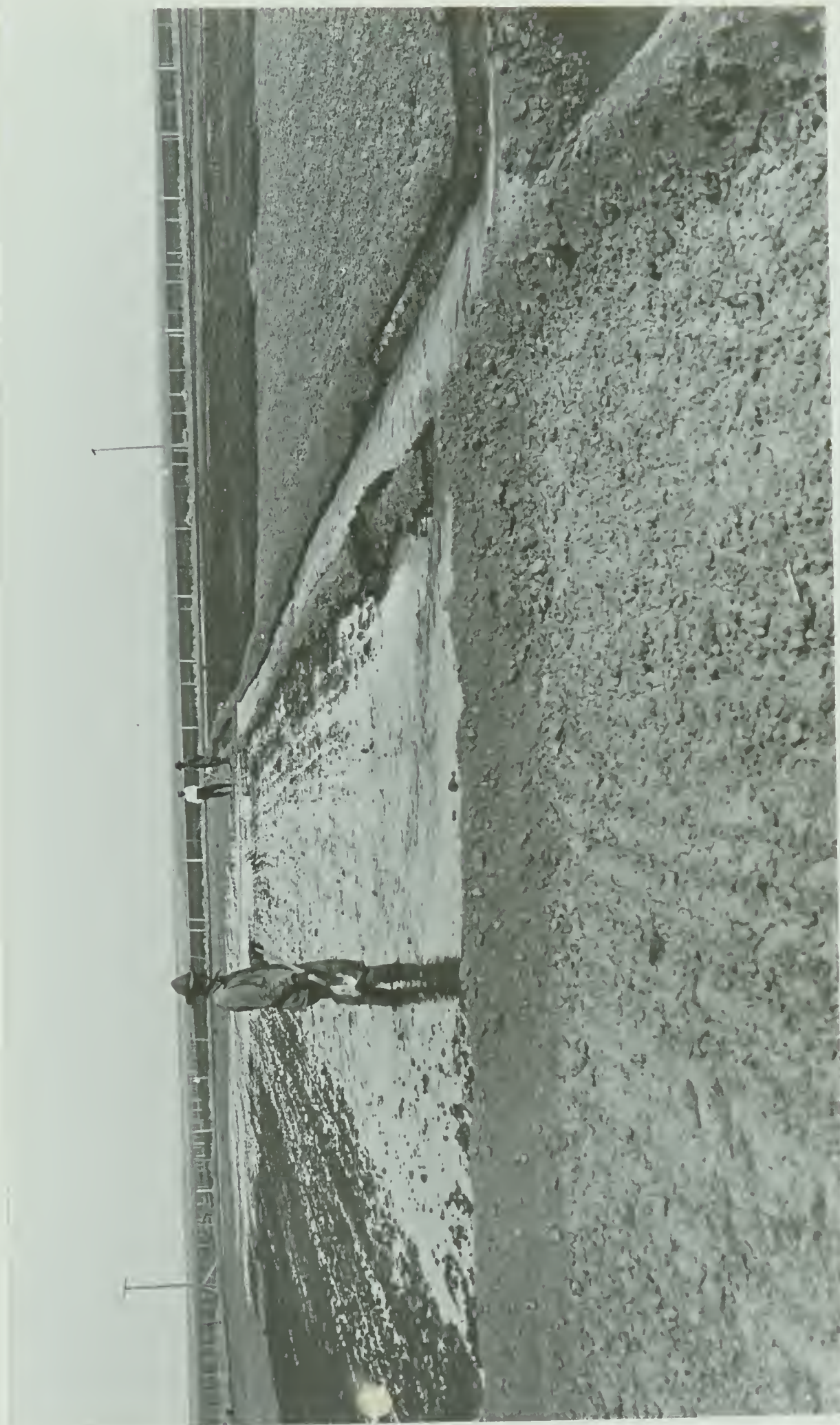


Photo 14 First Irrigation Efforts Near Lethbridge, 1901. Ernest Brown Collection, Alberta Provincial Archives.

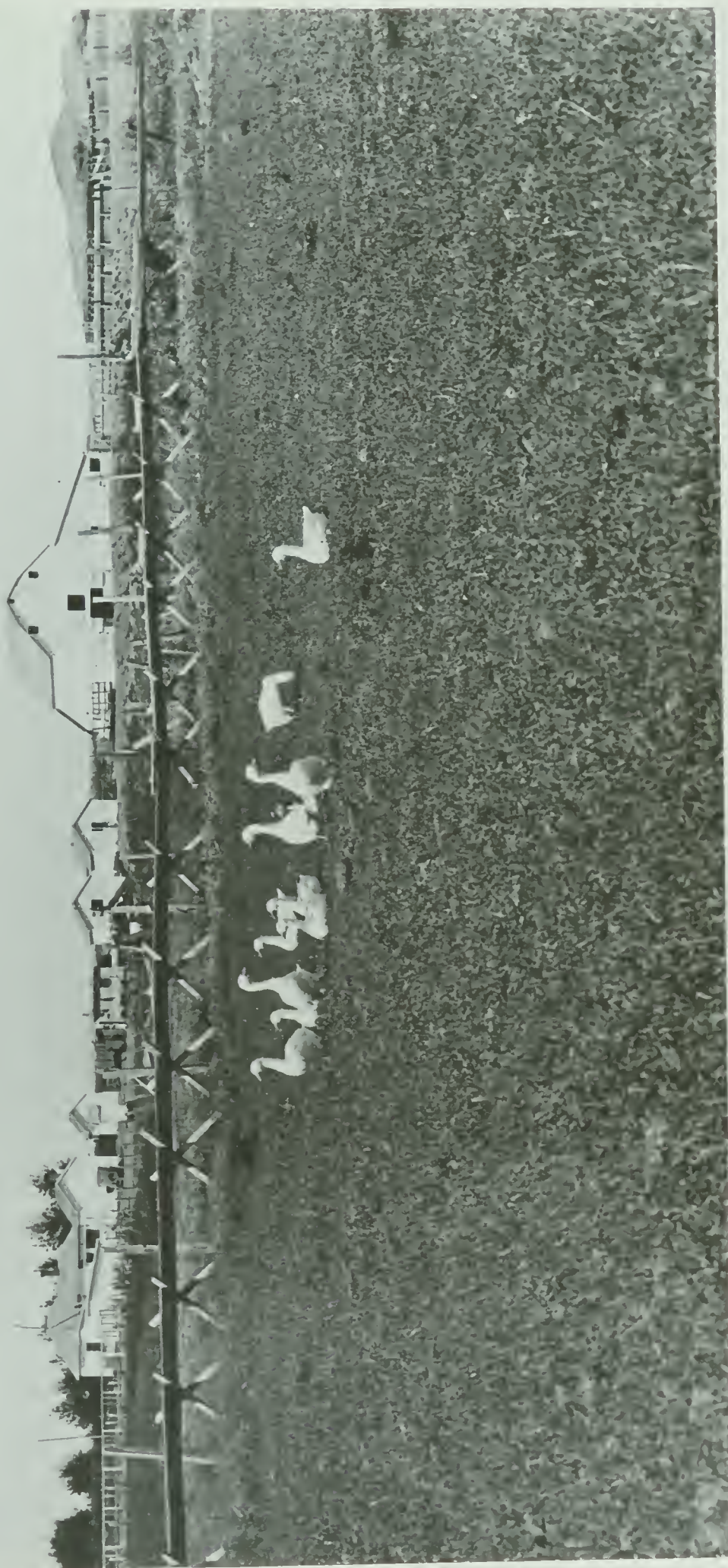


Photo 15 Flume Type Gravity Irrigation Near Coaldale, 1912. Ernest Brown Collection, Alberta Provincial Archives.



Photo 16 Tractor Powered Sprinkler Irrigation, 1939, Near Taber.
Courtesy Alberta Provincial Archives.

area, and are most commonly found on vegetable and sugar beet crops. The sprinkler irrigation systems, both stationary and moving self-propelled versions, allow water dispersal over much larger fields, and have greatly influenced the productivity of pasture land and grain crops. Sprinkler systems are generally operated by small gasoline motors, and water pressure, and require a minimum of labor for maintenance and operation. The moving sprinkler systems are the latest innovation, as they are now able to travel up and down the fields, dispersing water over a very large area.



Photo 17 Irrigation of Sugar Beets Near Taber, 1971.



Photo 18 Self-propelled Irrigation Sprinkler Near Barnwell, 1971.

EFFECTS OF IRRIGATION

The most obvious effects of irrigation on the Lethbridge-Medicine study area have been the great influences in the amount and value of productivity, and the tremendous increase in the value and area of land which can now be cropped. With the expanded use of irrigation in the study area, we have seen, through the development of the St. Mary and Milk River Irrigation Scheme, a growth of irrigation in the eastern part of the study area - a region which, previous to the 1950's was predominantly dry-land grazing and dry-land wheat growing. The diversity of agriculture, previously confined to the Lethbridge - Coaldale - Taber region,

until the 1950's, has become much more evident in the Bow Island - Seven Persons - Medicine Hat region. For the St. Mary scheme, water was dammed that had come from the St. Mary River, the Waterton River, and the Belly River. Since 1946, canals have been constructed eastward, to irrigate the lands as distant as Bullshead and Seven Persons, both immediately southwestward from the City of Medicine Hat.¹⁸

The use of irrigation has expanded and diversified the economy of the study area from a dry-land pasture and wheat area, into one of the irrigated grain, pasture and specialty crops - the most valuable being the sugar beet crop. Sugar beets were harvested near the Town of Raymond, Alberta, as early as 1903, and refined sugar produced in a factory in Raymond that had been built by Jesse Knight, of Provo, Utah.¹⁹ The factory was dismantled in 1915, and the sugar beet industry suffered a setback, until its revival in 1931, when the B.C. Sugar Refining Company of Vancouver built two new plants at Picture Butte and Taber.²⁰ Since that time, Taber has become the center of the intensive sugar

¹⁸N. S. Thomson, Water Policy Administration and History of Irrigation, 1967, p. 19.

¹⁹A. Johnston, The Role of Field Crops in Southern Alberta Agriculture, 1967, p. 8.

²⁰Loc cit.

beet industry. With the construction and success of the St. Mary and Milk River Irrigation Project, the lands near Medicine Hat, which were traditionally dry wheat lands, are beginning to be used to cultivate sugar beets, as the general movement of that crop within the study area has been from west to east.²¹

Since World War II, vegetables such as peas, beans, corn and potatoes have greatly influenced the productivity of the area, partly due to the initiative and imagination of the Japanese population who were relocated from the British Columbia coast to the Taber-Lethbridge districts during the war. By-products of the sugar beet industry and the canning industries have, along with reliable supplies of alfalfa and feed grains, stimulated the development of the feed lot industry. High quality feeder cattle can be found on the nearby shortgrass prairies and foothills country, where producers provide silage from feeding corn, grain and alfalfa, that were produced in the study area. Community pastures, with ample irrigation water to renew plant growth, are quickly replacing dry pastures, and have greatly increased the study area's ability to accomodate a quickly expanding farm cattle population.

²¹Pers. comm. J. W. Thiessen, Lethbridge, 1970.

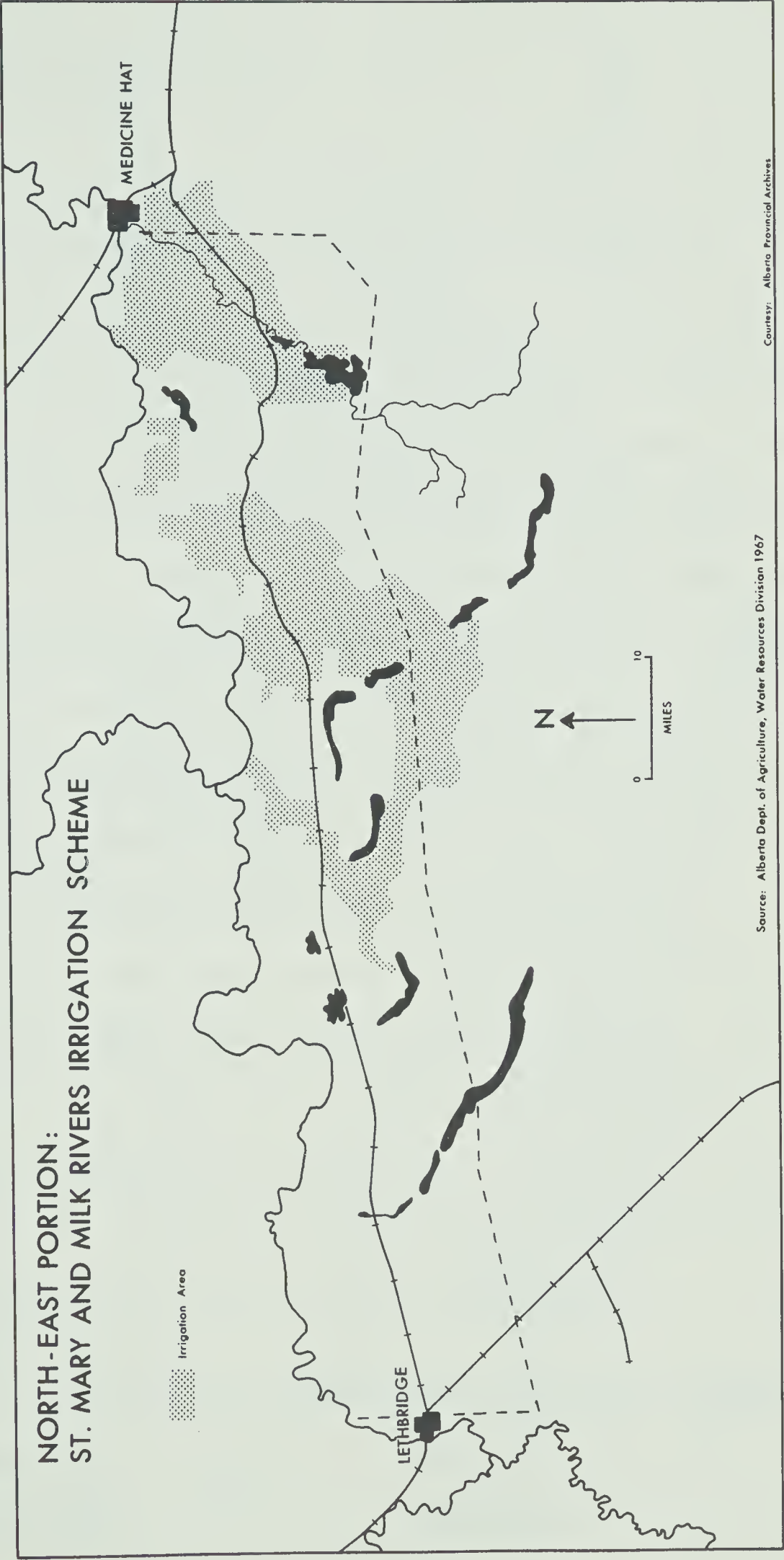
TABLE XXIX

PERCENTAGE OF AGRICULTURAL PRODUCTS SALES, FOR
THE LETHBRIDGE, TABER, BOW ISLAND AND
MEDICINE HAT DISTRICTS (1961)

<u>District</u>	<u>Product</u>			
	Wheat	Cattle	Dairy	Specialty Crops*
Lethbridge	20-25	30-35	5-10	20-25
Taber	25-30	30-35	0- 5	20-25
Bow Island	45-50	25-30	0- 5	0- 5
Medicine Hat	25-30	55-60	0- 5	5-10

*Specialty Crops are usually irrigated crops of fodder, potatoes, root crops (sugar beets), vegetables and greenhouse products.

Source: Atlas of Alberta, p. 71.



Source: Alberta Dept. of Agriculture, Water Resources Division 1967

Courtesy: Alberta Provincial Archives

MAP 5.2

TABER IRRIGATION DISTRICT

The Taber Irrigation District is located partially within the Lethbridge-Medicine Hat study area, and exemplifies the changes in land use and production that have been brought about by the use of irrigation. This District, containing about 40,000 acres under irrigation, has a slightly warmer and longer growing season than do districts farther eastward in the study area.²² Precipitation averages 13 inches, with 8 inches falling during the growing season.²³ With the potential evapotranspiration of about 23 inches, the average moisture deficit is about 14 inches.²⁴ The frost free season averages 120 days, with 3,000 growing degree days, over 42°F., during May to September (42° being established as the minimum temperature required for germination and plant growth).²⁵

In 1964, the Taber Irrigation District produced about 10,000 acres of sugar beets, 2,000 acres of canning peas, 2,000 acres of dry peas, 2,500 acres of sweet corn, 500 acres of fresh and canning vegetables, and large acreages of potatoes and alfalfa hay.²⁶ With over 40 percent of the Taber Irrigation District land under irrigation, its success has been outstanding.

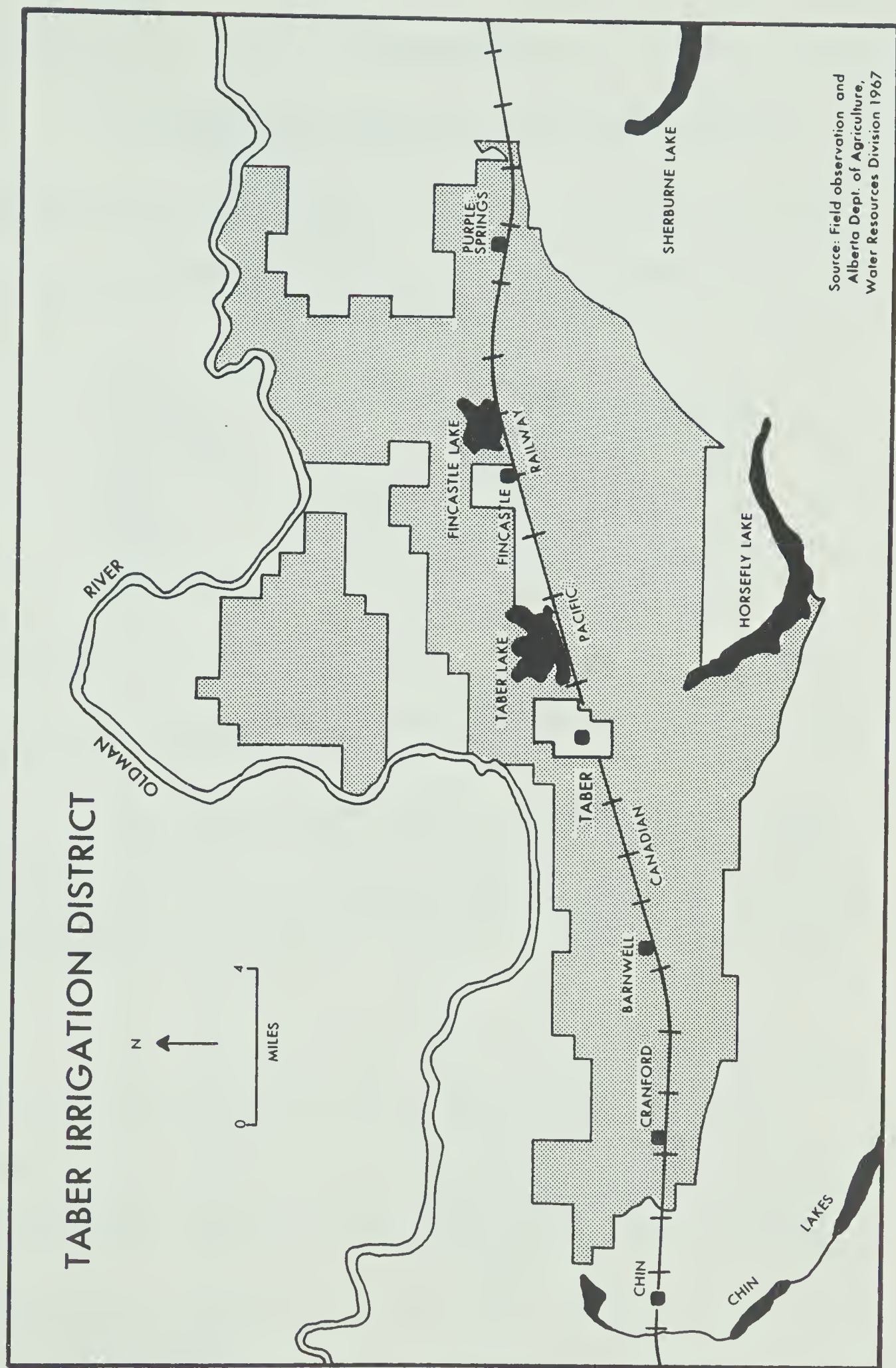
²² C. J. McAndrews, The Effects of Irrigation on a Region, p. 9.

²³ Loc. cit.

²⁴ Loc. cit.

²⁵ Loc. cit.

²⁶ Loc. cit.



Source: Field observation and
Alberta Dept. of Agriculture,
Water Resources Division 1967

MAP 5.3

TABLE XXX

AVERAGE PRODUCTION OF CROPS IN THE TABER
IRRIGATION DISTRICT (1925 - 30)

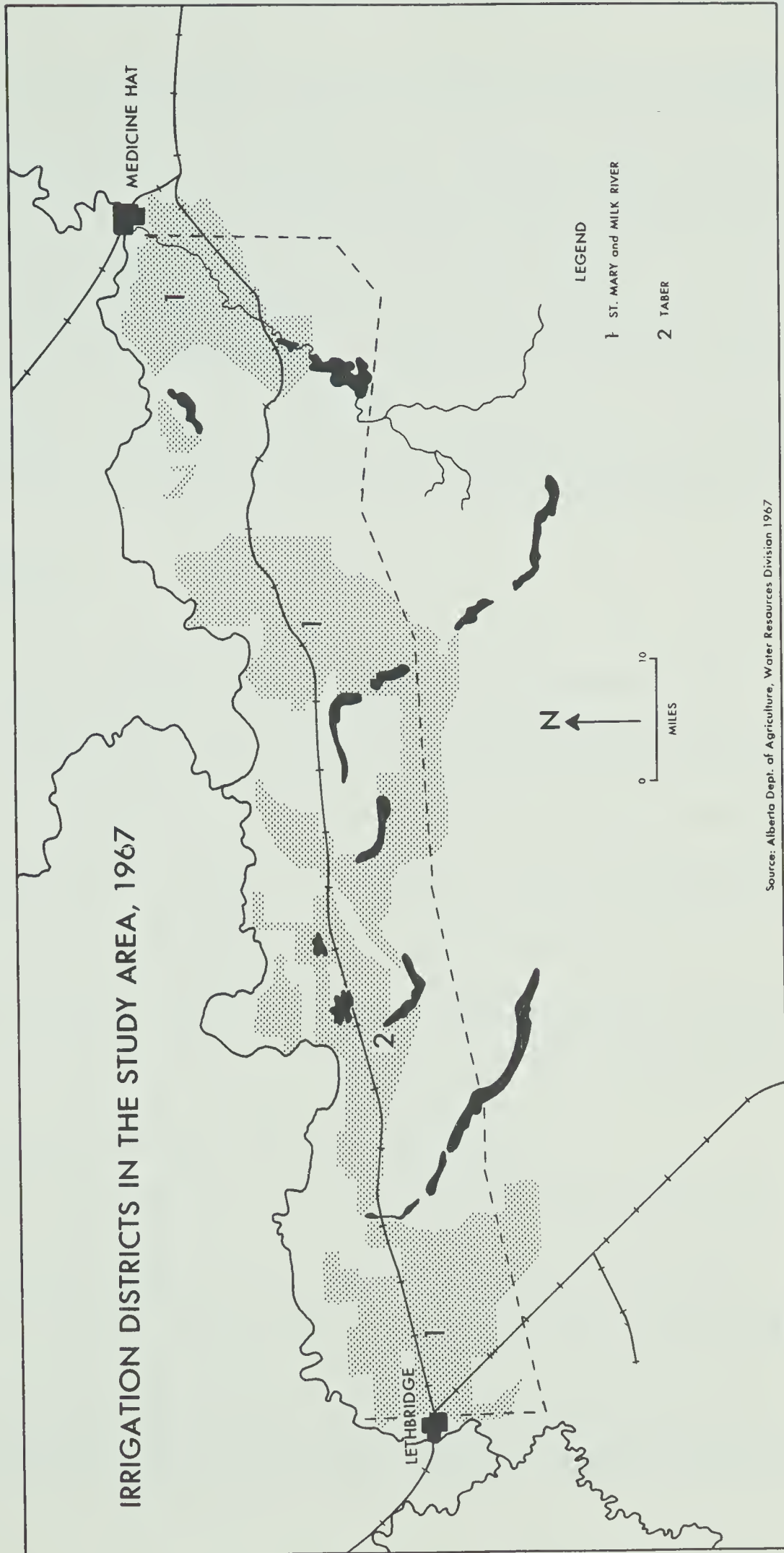
Crop	Production
Alfalfa	2.20 tons per acre
Timothy	1.16 tons per acre
Green feed	1.16 tons per acre
Spring wheat	20.76 bu. per acre
Oats	31.72 bu. per acre
Barley	23.70 bu. per acre
Sugar beets	8.51 tons per acre
Potatoes	3.88 tons per acre

From a report by T. Sundal, Secretary-Manager of Taber Irrigation District (1925-30).

Note: The Municipal District of Taber contains portions of several irrigation districts, one of which is the Taber Irrigation District. The M.D.T. contains a total farm acreage of 900,000 acres, of which 130,000 acres are under irrigation. The total farm population is over 6,000 and of the 1,200 farmers, more than 900 are irrigation farmers.²⁷

In the earlier discussion of the importance of 'tank towns' on the development of agricultural districts, it was noted that Taber was the most successful of these towns along the Medicine Hat-Lethbridge rail line. This is due to the fact that a symbiotic

²⁷Loc. cit.



Source: Alberta Dept. of Agriculture, Water Resources Division 1967

MAP 5.4

growth occurred between the town as a market, and the surrounding farming district, as a supply source. Because of the success of agriculture, mainly due to progressive irrigation practices in the Taber region, the population of the Town of Taber has grown to be greater than 4,000 (1964) and production has warranted the establishing of a sugar beet mill, a new canning factory, a potato processing and packaging plant and a thriving business district.

CONCLUSIONS

From the late 1890's through to the present day, the growth in production and diversity of agriculture in the study area has been outstanding. In many ways, this has come about through the development and expansion of irrigation. The development of a great number of specialty crops in an area that was once plagued by lack of water for pasture and grain crops has occurred, as well as an improvement in production of the two economic bases of the area, the livestock and grain industries.

The cattle ranchers, who migrated into the study area during the early 1880's, had no idea of the future agricultural development that was to take place, and in fact, they abhorred the thought of farmers dividing up and cultivating the grazing lands that supported the large cattle herds. With the railway, came the

change in emphasis to grain farming, although no apparent need was seen by these first farmers in the area, for irrigation schemes. However, as time went by, and the omnipresent threat of drought became apparent, farmers and ex-railway men began to realize that a stable crop production economy could only be achieved if a water supply could be assured throughout the growth and maturation season of the crops. The first major irrigation projects in the study area were those around Lethbridge, in 1901, and since then, private concerns such as railway companies (the A.R. & I.C.), and the federal and provincial governments, have sponsored irrigation schemes of such success and magnitude that the study area now contains the most intensively cropped lands in the entire province.

The growth in productivity and the increase in per acre land value, brought about by the use of irrigation, has caused considerable decreases in the average size of irrigation farms and has, as well, caused an increase in farm specialization. Where the farm economy of the study area was once one of dry-land grain farming and cattle production (on dry-land pastures), the economic base has been somewhat diversified, through irrigation, to produce those crops that will have a comparative advantage at the market place. A warm summer climate, with controlled

moisture for the soil, has proven beneficial to the production of such crops as alfalfa, sugar beets, vegetables, some oil crops and community pastures. With irrigation, the cost of these crops is low, and the resulting yields are quite high - thus the need for large acreages has been eliminated. The situation has arisen within the study area where those crops that can be grown only with the reliable moisture conditions of irrigation, have usually become the first choice with the grower.

Presently, provincial government agronomists and engineers are involved in schemes to assist farmers in irrigation districts to overcome soil salinity and the problems of drainage, which are both side effects of irrigation, to further economize crop production. The text included in this chapter, supplemented by additional reading on southern Alberta's irrigation development, bring about a realization that the development of irrigation, and the diversification of crop production, are the results of a series of changes in perception combined with advances in technology. The first settlers into the region possessed little or no accurate knowledge concerning the climatic conditions. The consequent changes in land use, farm sizes, and agricultural practices, gained through the farming experiences on a trial-and-error basis, laid the foundation for later generations of farmers in the district.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The Lethbridge-Medicine Hat study area has witnessed, over the past 100 years, very significant land use changes, and the development during the 1890 - 1912 period, of a rather unique settlement process and pattern. Through the years since initial land take-up by homesteaders, changes in perception, influenced by the extent of knowledge of the area, and trial-and-error farming practices, have resulted in the transformation of an unreliable dry-land grazing and grain farming area into a modern, efficient and intensely cropped agricultural region. By randomly selecting a stratified sample of quarter sections within the study area, and investigating the history of these quarter sections (from the date of the homestead entry application), it was possible to isolate the effects of different cultural and physiographic phenomena on homestead location and success.

Changes in perception, resulting from responses to incorrect farming methods and environmental characteristics, have been the key to the success and growth from a dry-land grazing economy to the diversified and highly scientific controlled agri-

cultural economy now found in the study area. The experience of many years of farming in the area, and countless adjustments has led to the development of precise methods of calculating and classifying its physiographic features, and has enabled agriculturalists to devise new methods to compensate for the unfavorable conditions of the climate, soil and vegetation. Had the scientific data been available at the time of initial homestead take-up, quite possibly, the entire 'sequent occupance' and homestead pattern would have been different.

The ranchers who first entered the area in the 1870's and 1880's were forced to leave their range lands in the United States when the migration of agricultural settlers to the west followed the American Homestead Act. These ranchers saw the study area as a vast empty land, perfectly suited to cattle grazing. With no previous ranching experience in the area to fall back on, however, they greatly overestimated the carrying capacity of the natural short grasslands. The first attempts to graze one head of cattle on every 10 acres almost destroyed the natural grassland, and government intervention soon restricted grazing to one head per 30 acres. Because the ranching era in the study area was of short duration, (about 1880 - 1885), very little valuable information concerning natural conditions could be passed on to the homesteaders and railway men who first took up agricultural land.

The railway between Lethbridge and Medicine Hat that followed in 1885, was the direct result of inaccurate judgment about the capacity of the Oldman-South Saskatchewan River as a transportation route. Exploitation of the natural resources of the study area at this time took form as a mining of coal seams on the Oldman River Valley at Coalbanks and Woodpecker. Riverine settlement dominated until the Homestead rush following the railway construction in 1885.

Although the narrow gauge rail line joining Lethbridge to Medicine Hat - Dunmore was used initially for hauling coal - it became the main source of transportation for settlers entering the area. So eager were the homesteaders to settle the study area, and so uninformed were they of the physiographic features, that homestead sites were chosen 'sight unseen,' irrespective of climate, vegetation, distance from towns and soil capability conditions. Unlike the more northerly areas thrown open for homesteading, with substantial variations in quality and density of forest cover, the uniformity of the treeless short-grass prairies offered little opportunity for selection of land in terms of natural vegetation cover. This initial wave of immigrants was totally unprepared for the arid conditions that prevailed, and many homesteaders were forced, through lack of water for stock and crops,

to abandon their homestead claim. The lack of tree cover apparently was of little consideration in homestead site selection, and the Homestead Files revealed very little correlation between the success of the homestead and capability of the soil for agriculture, distance from 'tank towns,' distance from the railway, and distance from available surface water. These facts, combined with the fast rate of homestead take-up, indicate that the homesteaders had only one main concern, and that was to obtain a piece of land, regardless of its condition. Failure followed many homesteaders, but the large proportion of successful patents is proof of the tenacity that characterized many of the first farmers in this area.

One might assume, under the condition of normal homestead take-up that sites nearest to towns and railways, for convenience of communication, supplies and markets, would be taken up first. However, in the settling of the study area, advertising brochures painted such a glorious picture, that prospective immigrants purchased homestead sites wherever they could get them. The results, as evidenced in the Homestead Files, substantiate this fact, as very little relationship exists between location of the homestead, and the date of the entry application. Here again, the anxiety to obtain a piece of land seemed to be the overriding

factor.* As well as evaluating the role of physical determinants in the land selection process, the thesis has also investigated the main cultural factors affecting settlement and land use change. An investigation concerning the relationship between homestead success and such factors as place of birth, place of origin, and family size of the homestead family unit, was carried out. Again using data from the Homestead Files, cross tabulations revealed little relationship between homestead success and place of birth or family size. In other words, one could not say that a larger family (more available labor) meant a better chance of homestead success, because many other factors, such as the costs involved in supporting a large family, were involved. The place of birth of the homesteader proved to be of little consequence, as many families of European origin had had farming experience in the United States and Canada. It was this fact, the place of origin, or last place of residence, which gave a rather positive correlation with homestead success. The Homestead Files revealed that those settlers from North Dakota and Utah met with the greatest success in the study area because they had already had previous dry-land farming experience. This experience proved invaluable in the semi-arid con -

Note: The Homestead Files revealed very little evidence of ethnic or linguistic clustering, as both ethnic background - homestead location, and name clustering were investigated.

ditions of the study area. The Homestead Files also revealed that of the total number of homesteaders entering the study area, 65.2 percent had previous farming experience, while only 24.6 percent had previously worked at occupations having no connection with farming.

The Depression and Dust Bowl of the 1930's contributed greatly to the changes in land use in the study area. A combination of circumstances accelerated the change from extensive grain cropping to intensive irrigation farming. Grain farming was somewhat hazardous due to inept cultivation methods, and when combined with the adverse climatic conditions, soil drifting occurred and destroyed much of the valuable land. At the same time, the depression lowered market prices for produce, and created what might have been called an agricultural 'debt' economy. During this period, large scale land abandonment occurred, caused by poor market prices for farm produce, and the accumulation by farmers of large debts which had been built up as farmers attempted to keep their farms operational. The eastern portion of the study area (Bow Island to Medicine Hat) suffered the most, because it had only limited irrigation lands, and was affected very severely by soil drifting. The Dust Bowl of southern Alberta included most of the study area, and was a natural catastrophe resulting from

human error. Previous to the 1930's farmers practiced cultivation of their fields, with little thought of soil conservation, and maintenance of adequate fibrous materials in the soil. Following a series of drought years, soil began to blow with the ever present winds, and for the period 1930 to 1937, large scale destruction of valuable land was witnessed. Again, many farms were abandoned, and either reclaimed as homesteads, or reverted to grazing lands.

As agriculturalists became aware that their cultivation methods were, in part, responsible for the large scale soil drifting, they began to investigate methods of alleviating this problem. A definite change in perception can be seen, as farmers started to conserve soil, rather than crop the largest acreage possible, year after year. Methods of soil drifting control that were developed in the study area, and are still widely used, have, for the most part, eliminated soil drifting.

When discussing the effects of irrigation on the agricultural pattern of the study area, we can again say that definite changes in perception of farmers in the area occurred. Dry-land ranchers and farmers had, through years of experience in the study area, become aware of the constant threat of drought years, and quite often, crop production was virtually worthless. Good crop years, on the other hand, provided a comfortable standard of living for most farm

families, but the inconsistency of the good years greatly limited the agricultural economy of the area. This fact, combined with increasing world demand for food and the loss of valuable land during the Dust Bowl era, brought about the need for widespread irrigation. It was found that in a semi-arid area, such as the study area, controlled water supply was necessary to provide consistent year-by-year crop production. Irrigation was thus initiated through a growing awareness that dry-land agriculture did not make the best value of the potential of soils and climate in the area.

Through field observation, the most notable land use change has been the great reduction in the area of dry-land grazing and grain cropping, and the immense increase in acreages of irrigated pasture, irrigated grains and vegetables. Of extreme significance to the study area, has been the development of the sugar beet economy, which, on many irrigated farms, has become the mainstay of the farm economy. The growing realization of the value of irrigation has continued to the present day, as the movement of irrigation is from west to east in the study area, with the latest construction efforts being aimed at irrigating the Seven Persons-Bullshead area. Irrigation has provided for greater versatility, efficient land use, and the assurance of high crop production, even in drought years.

The total evidence produced in this thesis then, seems to indicate the initial ignorance of environmental conditions in the study area, and constant adapting, as years of farming experience were gained, resulting in changing farming methods adopted to counteract the detrimental environmental conditions. Since little was known of the natural environment at the time of the homestead rush, very little attention was given to climatic, vegetative, and soil conditions. Changes in agricultural methods were generally brought about as responses to human error.

The major difficulties or shortcomings in gathering the necessary data were in the fact that the Homestead Files were not consistent for every variable used. As well, interviews were somewhat restricted to agriculturalists and a few old-timers of the area, as the date of the initial homestead rush, and the cattle - railway eras severely limited the number of individuals who could make substantial contributions to this project. When dealing with the 'modern' era, (post 1930), it was difficult to limit statistics to the boundaries of the study area, as the irregular shape of the area was included in three irrigation districts, (Lethbridge, Taber and Eastern I.D.), along with several municipal districts and agricultural districts. For this reason, some of the data, particularly dealing with irrigation were taken from more general Alberta

agricultural statistics. Had more time been available for the study, and more specific data been available for comment, perhaps a better picture of the study area, as far as recent agricultural developments are concerned, could have been presented. A present day land use study would, however, provide ample challenge and interesting results for further research in this study are.

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